

Arithmetic for Everyday Use Book 3

by

G. F. Pew

and

W. H. Jennings

CURRICULUM

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Sir Isaac Pitman & Sons (Canada), Ltd.
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TO THE STUDENT

1. STUDY THE INSTRUCTIONAL MATERIAL GIVEN WITH EACH UNIT.

Basically, arithmetic is a matter of addition, subtraction, multiplication and division. Commercial arithmetic involves the application of these fundamental operations to business transactions. It is obvious, therefore, that you must become familiar with business practices in order to apply the principles of arithmetic to business transactions.

Each unit in this workbook illustrates and provides practice in applying basic operations to business problems. A minimum of instructional material, which is intended to provide a basis for class-room discussion on the topic, is followed immediately by a wealth of exercise material. As far as has been considered feasible, the applications have been chosen from assignments likely to be encountered by the student entering business in any locality.

2. PRODUCE THE KIND OF WORK THAT WOULD BE ACCEPTABLE TO AN EMPLOYER.

To meet this objective, your work must be:

- (1) *Accurate.* Check carefully all addition, subtraction, multiplication, and division, to ensure accuracy in all your work.
- (2) *Neat and legible.* Be particularly careful in making figures; illegible figures cause errors. Set up your solution in a neat, logical form. Let the answer to the solution stand out distinctly.
- (3) *Grammatically correct.* The wording of a solution to a problem should be grammatically correct. Be particularly careful in using the ditto and the equal signs.

3. COMPLETE YOUR ROUGH CALCULATIONS ON THE BLANK SHEETS PROVIDED AT THE BACK OF THE BOOK.

4. COMPLETE THE REVIEW ASSIGNMENT FOR EACH UNIT BEFORE PROCEEDING TO THE NEXT UNIT.

5. KEEP YOUR FINISHED WORK AVAILABLE FOR REVIEW PURPOSES.

Your solutions to the problems in this book will be written immediately after the statement of the problem. You will find this arrangement very convenient when reviewing completed work in preparation for tests and examinations. Of course, the effectiveness of your review will depend upon the accuracy of your original work.

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UNIT 1

FUNDAMENTAL OPERATIONS WITH WHOLE NUMBERS

ADDITION AND SUBTRACTION

In all arithmetic calculations in the business office, accuracy is essential. The office worker must learn to calculate quickly and accurately, and to ensure accuracy, he must learn to check his work carefully.

1. Add the following columns both up and down. Using a sharp pencil, write your answer in pin-point figures until you are sure it is correct.

(1)	(2)	(3)	(4)
21346	12993	25360	65341
46509	36174	96729	129875
26723	96326	6927	234660
46748	67025	10963	107171
92336	30907	56768	69311
46991	21945	9309	235742
63882	68429	16792	169737
56119	30705	8448	318896
62334	56071	16907	466009
56971	29508	9709	316985
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>

2. Add the following. Check carefully.

(1)	(2)	(3)	(4)
24786	126529	978346	126590
3629	135756	162449	130995
16723	125763	298509	279260
69871	162784	630665	366555
23656	462150	494550	290940
19728	296355	299375	355115
62149	162763	755045	459220
73657	216505	699995	306666
21545	162995	716308	261550
61975	125125	650570	160963
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>

3. Subtract the following. Check by addition.

(1)	(2)	(3)	(4)
467.23	5627.46	1365.42	1265.49
398.13	4633.84	964.81	1096.74
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>
(5)	(6)	(7)	(8)
1693.39	23645.36	46293.17	56349.91
1488.67	11798.72	21096.14	47450.89
<hr/>	<hr/>	<hr/>	<hr/>
<hr/>	<hr/>	<hr/>	<hr/>

ADDITION AND SUBTRACTION

1. Find the balance in the following account. (Total each side and subtract the smaller total from the larger.)

CASH

19-- Oct.	1	Balance		1683	15	19-- Oct.	3			72	31
	4			27	29		5			131	29
	7			623	84		7			239	89
	11			293	19		11			681	43
	14			379	98		15			231	89
	17			264	83		20			621	85
	27			293	48						

2. Extend the balances for each date in the following account. (Add the items in the debit column to the balance and subtract those in the credit column.)

SMITH, Mrs. Robert E., 144 Lowe Avenue

DATE		PARTICULARS	F	DEBIT		CREDIT		BALANCE	
19-- Sept.	1	Balance	✓					1669	43
	3			46	18				
	5			169	27				
	7					213	84		
	9					215	47		
	11			168	47				
	13			219	89				
	15					63	01		
	24			211	17				
	30			13	09				

3. Extend the balances for each date on the following stock cards. (Add the items in the IN column to the balance and subtract those in the OUT column.)

(1) HANDLES—16 Oz. Carpenter Hammers

(2) HANDLES—Machinist Hammers

DATE		MEMO	IN	OUT	BAL.
19-- Jan.	2				1320
	3			24	
	7			120	
	10		200		
	11			64	
	15		124		
	17			144	
	22		246		

DATE		MEMO	IN	OUT	BAL.
19-- Oct.	1				424
	3		244		
	7			120	
	11		360		
	12			400	
	15		209		
	17			164	
	20			145	

ADDITION AND SUBTRACTION

Many of the arithmetic problems in the office involve nothing but addition and subtraction.

EXAMPLE—A business firm reports the following facts regarding its merchandising activities for the month of January:

Goods on Hand, January 1	\$8000.00
Purchases	6000.00
Purchase Returns	100.00
Freight and Duty on Purchases	175.00
Sales	5000.00
Goods on Hand, January 31	9900.00

Determine the Gross Trading Profit.

	<i>Income</i>	
Merchandise Sales.....		\$5000.00

Merchandise Sales.....			\$5000.00
	<i>Costs</i>		
Goods on Hand, January 1.....		\$8000.00	
Add Purchases.....	\$6000.00		
Plus Freight and Duty.....	175.00		
	<u>6175.00</u>		
Deduct Purchase Returns.....	100.00	6075.00	
Total Cost of Goods.....		<u>14075.00</u>	
Less Goods on Hand, January 31.....		9900.00	
Cost of Goods Sold.....			4175.00
Gross Trading Profit.....			<u>\$ 825.00</u>

1. In the spaces provided below, calculate the Gross Trading Profit.

	(1)	(2)	(3)	(4)
Goods on Hand, January 1	\$ 9100.00	\$11450.00	\$35565.00	\$3454.95
Sales	7500.00	12400.00	43575.85	8751.53
Purchases	8155.43	8998.78	35765.45	3897.87
Freight and Duty on Purchases	178.78	789.79	1234.45	187.58
Purchase Returns	157.77	345.65	876.67	87.75
Goods on Hand, January 31	11185.10	9989.90	33451.87	1234.44

[illegible]

ADDITION AND SUBTRACTION

1. The following table indicates attendance on ten city playgrounds during the fourth week of July. Calculate the total attendance for each playground for the week. Calculate also the total attendance for each day and for the week.

PLAYGROUND	MON.	TUES.	WED.	THUR.	FRI.	SAT.	TOTAL
Begley	85	107	69	141	97	108	
Broadhead	103	146	121	169	98	157	
Jackson	549	607	677	589	631	598	
Kinsmen	408	478	508	673	642	737	
Memorial	793	801	767	769	744	893	
Parent	149	143	131	356	189	147	
Prince Road	983	1147	1236	1149	989	1239	
Riverview	271	233	268	199	253	236	
Rossini	843	986	1157	1098	799	1345	
Sandwich	169	157	177	203	147	169	
TOTALS							

2. The following amounts are recorded in the branches of a chain store. Calculate the net profit for each store and also the totals for the various accounts. Determine the total profit for the four stores.

ACCOUNT	STORE NO. 1		STORE NO. 2		STORE NO. 3		STORE NO. 4		TOTAL	
Total Sales	46,208	36	39,234	87	23,307	15	31,309	86		
Less Returned Sales	157	18	237	60	69	83	103	48		
Net Sales										
Inventory, January 1	21,367	41	19,462	15	10,708	36	14,208	69		
Purchases	46,219	21	41,308	10	23,107	15	32,301	48		
Total Cost of Goods										
Inventory, December 31	26,265	00	25,091	15	13,608	14	18,271	56		
Cost of Goods Sold										
Gross Trading Profit										
Operating Expense										
Salaries	1,143	51	1,203	18	600	00	869	23		
Advertising	475	00	610	50	135	36	207	46		
Rent	860	00	850	00	550	00	650	00		
Insurance	65	00	54	00	22	50	26	80		
General Expense	165	00	155	15	86	50	117	10		
Total Expense										
Net Profit										

MULTIPLICATION AND DIVISION

Multiplication by numbers up to twelve should be completed in one operation. You should review the multiplication tables thoroughly.

1. Multiply as indicated.

$\begin{array}{r} 4\ 6\ 5\ 3\ 2\ 7 \\ \underline{} \\ 2 \end{array}$	$\begin{array}{r} 2\ 3\ 6\ 8\ 7\ 7 \\ \underline{} \\ 3 \end{array}$	$\begin{array}{r} 4\ 5\ 6\ 7\ 8\ 9 \\ \underline{} \\ 4 \end{array}$	$\begin{array}{r} 7\ 8\ 0\ 9\ 6\ 4 \\ \underline{} \\ 5 \end{array}$	$\begin{array}{r} 3\ 8\ 9\ 6\ 2\ 3 \\ \underline{} \\ 6 \end{array}$
$\begin{array}{r} 2\ 4\ 6\ 6\ 3\ 8 \\ \underline{} \\ 7 \end{array}$	$\begin{array}{r} 3\ 4\ 3\ 4\ 6\ 2 \\ \underline{} \\ 8 \end{array}$	$\begin{array}{r} 9\ 8\ 6\ 7\ 2\ 3 \\ \underline{} \\ 9 \end{array}$	$\begin{array}{r} 5\ 3\ 7\ 8\ 3\ 9 \\ \underline{} \\ 1\ 1 \end{array}$	$\begin{array}{r} 4\ 6\ 9\ 8\ 7\ 2 \\ \underline{} \\ 1\ 2 \end{array}$

Frequently, in calculating or checking invoices, the office worker must multiply horizontally. This should be done directly with numbers up to 12.

2. Calculate the extensions and totals of the following invoices.

(1)

(2)

24 lb. @ .07 a lb.			125 yd. @ .11 a yd.		
35 " " .09 " "			319 " " .12 " "		
67 " " .11 " "			108 " " .09 " "		
89 " " .06 " "			125 " " .06 " "		
52 " " .07 " "			305 " " .08 " "		
Total			Total		

(3)

(4)

127 lb. @ .06 a lb.			6 lb. @ 1.29 a lb.		
319 " " .11 " "			7 " " 3.15 " "		
408 " " .09 " "			12 " " 4.11 " "		
511 " " .07 " "			11 " " 2.07 " "		
293 " " .03 " "			9 " " 11.25 " "		
Total			Total		

(5)

(6)

3 tons @ 18.25 a ton			12 baskets @ 1.25 a basket		
5 " " 21.50 " "			9 " " .85 " "		
12 " " 23.50 " "			11 " " 1.15 " "		
9 " " 24.25 " "			7 " " 2.20 " "		
6 " " 26.10 " "			8 " " 3.25 " "		
Total			Total		

MULTIPLICATION AND DIVISION

In multiplying by numbers larger than 12, the student should be careful to watch the alignment of the figures in his solution.

1. Keeping the figures carefully aligned, multiply as indicated below. Remember to check carefully.

(1) $\begin{array}{r} 6\ 5\ 6\ 3\ 8\ 9 \\ \underline{3\ 4\ 5\ 6} \end{array}$	(2) $\begin{array}{r} 9\ 7\ 6\ 8\ 3\ 4 \\ \underline{5\ 2\ 6\ 8} \end{array}$	(3) $\begin{array}{r} 3\ 5\ 6\ 7\ 2\ 9 \\ \underline{2\ 7\ 3\ 6} \end{array}$	(4) $\begin{array}{r} 6\ 4\ 2\ 0\ 7\ 1 \\ \underline{5\ 9\ 8\ 7} \end{array}$

Short Methods in Multiplication

You have learned that certain numbers lend themselves to convenient short-cuts in multiplication. A brief review of three common short-cuts follows.

- (1) With numbers ending in zero or zeros, multiply by the number preceding the zero and add a zero for each zero in the multiplier.

EXAMPLE— $300 \times 17 = 3 \times 17$ plus 2 zeros = 5100

- (2) With numbers that are simple fractions of 100, multiply by adding 2 zeros, and dividing the result by the number of times the number is evenly contained in 100. This can also be done with fractions of 1000, 10000, etc.

EXAMPLE— $25 \times 64 = 6400 \div 4 = 1600$ (25 is one quarter of 100)

EXAMPLE— $125 \times 64 = 64000 \div 8 = 8000$ (125 is one eighth of 1000)

- (3) With numbers that are close to 100, multiply by 100 (add 2 zeros), and add or subtract to adjust your answer.

EXAMPLE— $101 \times 24 = 100 \times 24 = 2400$
 Plus 1×24 or $\underline{24}$
 = 2424

EXAMPLE— $99 \times 24 = 100 \times 24 = 2400$
 Subtract 1×24 or $\underline{24}$
 2376

2. Using short methods, multiply as indicated.

$101 \times 27 =$					$101 \times 26 =$					$101 \times 37 =$				
$100 \times 12 =$					$700 \times 8 =$					$900 \times 11 =$				
$50 \times 36 =$					$48 \times 75 =$					$224 \times 25 =$				
$102 \times 22 =$					$103 \times 21 =$					$99 \times 65 =$				
$58 \times 50 =$					$16 \times 25 =$					$32 \times 75 =$				
$102 \times 41 =$					$1001 \times 27 =$					$101 \times 162 =$				
$44 \times 25 =$					$99 \times 31 =$					$102 \times 61 =$				

MULTIPLICATION AND DIVISION

1. Extend and total the following invoices, using short methods of multiplication where possible

(1)

101 yards @ .74 a yd.					
99 " " .35 " "					
10 " " 1.15 " "					
25 " " .80 " "					
50 " " 1.60 " "					
Total					

(2)

99 lb. @ .45 a lb.					
98 " " .35 " "					
101 " " .69 " "					
102 " " .36 " "					
20 " " .75 " "					
Total					

(3)

26 lb. @ .07 a lb.					
35 " " .11 " "					
50 " " .44 " "					
75 " " .88 " "					
25 " " .48 " "					
Total					

(4)

36 ft. @ .25 a ft.					
20 " " .35 " "					
120 " " .75 " "					
99 " " .27 " "					
102 " " .35 " "					
Total					

(5)

68 bskt. @ .50 a bskt.					
55 " " .40 " "					
35 " " .60 " "					
17 " " 1.01 " "					
24 " " 1.02 " "					
Total					

(6)

16 gal. @ 1.25 a gal.					
24 " " 1.50 " "					
36 " " 2.50 " "					
48 " " 7.50 " "					
12 " " 5.00 " "					
Total					

(7)

101 yd. @ .77 a yd.					
102 " " .42 " "					
99 " " .57 " "					
98 " " .14 " "					
15 " " .24 " "					
Total					

(8)

68 qt. @ 2.50 a qt.					
12 " " 1.81 " "					
57 " " 2.01 " "					
25 " " 4.40 " "					
120 " " 1.01 " "					
Total					

MULTIPLICATION AND DIVISION

Division by numbers up to 12 should always be done by short division. A thorough knowledge of the multiplication tables up to 12 is essential for rapid and accurate division.

1. Complete the following exercises by short division.

(1) $\begin{array}{r} 5 \overline{) 96470220} \\ 6 \overline{) } \\ 7 \overline{) } \end{array}$	(2) $\begin{array}{r} 2 \overline{) 25407360} \\ 3 \overline{) } \\ 4 \overline{) } \end{array}$	(3) $\begin{array}{r} 8 \overline{) 355523040} \\ 9 \overline{) } \\ 10 \overline{) } \end{array}$	(4) $\begin{array}{r} 8 \overline{) 88665984} \\ 9 \overline{) } \\ 11 \overline{) } \end{array}$
(5) $\begin{array}{r} 9 \overline{) 756213480} \\ 10 \overline{) } \\ 11 \overline{) } \end{array}$	(6) $\begin{array}{r} 7 \overline{) 426501936} \\ 8 \overline{) } \\ 9 \overline{) } \end{array}$	(7) $\begin{array}{r} 9 \overline{) 144473868} \\ 11 \overline{) } \\ 12 \overline{) } \end{array}$	(8) $\begin{array}{r} 9 \overline{) 263999736} \\ 11 \overline{) } \\ 12 \overline{) } \end{array}$

For divisors greater than 12, long division should be used. It is essential that the numbers be aligned correctly in the solution if errors are to be avoided.

2. Complete the following exercises by long division.

(1) $24 \overline{) 16128}$	(2) $57 \overline{) 35423}$	(3) $327 \overline{) 41856}$
(4) $1673 \overline{) 9763842}$	(5) $9287 \overline{) 6930063}$	(6) $3694 \overline{) 20621345}$

PROBLEMS

1. The average weekly earnings of the workers in a municipality are \$56.13. If the number of workers is 15,200, what is the amount of the: (a) Total weekly earnings? (b) Total annual earnings? (c) Total monthly earnings?

2. If the workers in the municipality in Problem 1 receive a 4 cent-an-hour pay increase, and the average week worked is 40 hours, what is the total additional income: (a) For a week? (b) For a year?

3. A school enrolls 1,456 students. If there are 52 teachers on the staff, what is the ratio of students to teachers? If there are 197 school days in the year, what is the perfect aggregate attendance for the year?

4. If it costs \$353,808 a year to operate the school, mentioned in Problem 3, what is the cost per pupil? If there are 197 teaching days in the year, what is the cost per day per pupil?

PROBLEMS

5. A student has a chance to apply for two positions. The wage for the first is \$27.50 a week for 3 months (13 weeks), and then the rate is increased to \$30 a week. The wage for the second is \$115 a month for 6 months, and then there is an increase to \$135 a month.

(a) For which position is the wage higher during the first year, and by how much?

(b) By how much would the wage from the better position exceed that from the poorer over the first five years?

6. An automobile manufacturing company has an order for 650 trucks. Each truck requires 6 yards of seat covering.

(a) What is the cost per truck if the material costs \$3.17 a yard?

(b) What is the total cost?

(c) If a material costing \$2.79 a yard were used, what would be saved on the order?

7. The reading on an electric light meter was 1640 kilowatt hours at the previous reading, and 2560 at the present reading. If the rate is 3¢ for the first 120 kilowatt hours, and 1¢ for each additional hour, what is the amount of the bill?

8. A family lives in a home on which the mortgage payments are \$300 a year, and the interest on the mortgage is \$250 a year. It requires 7 tons of coal at \$25 a ton to heat it. Water and electricity bills together average \$8 a month. Taxes are \$175 a year. What does it cost to live in the house for:

(a) A year? (b) A month?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Add.

(1) 456.78 123.71 45.45 543.23 101.98	(2) 345.78 324.75 123.56 876.56 156.50	(3) 789.34 123.45 342.22 301.11 234.78	(4) 543.23 324.55 123.45 345.56 876.34	(5) 876.78 187.34 198.99 981.14 189.09	(6) 234.55 155.05 234.98 345.54 891.10
---	--	--	--	--	--

2. Subtract.

(1) 345.78 311.88	(2) 890.09 789.94	(3) 143.34 87.87	(4) 156.89 90.58	(5) 789.00 439.19	(6) 345.90 307.46
----------------------	----------------------	---------------------	---------------------	----------------------	----------------------

3. Divide.

(1) 3)45624	(2) 7)37877	(3) 9)82989	(4) 11)1232	(5) 12)3744	(6) 8)18048
-------------	-------------	-------------	-------------	-------------	-------------

4. Multiply.

(1) 45673 7	(2) 23456 4	(3) 45678 9	(4) 98745 11	(5) 34568 8	(6) 34568 12
----------------	----------------	----------------	-----------------	----------------	-----------------

5. Calculate.

(1) $27 \times 9 =$ $13 \times 7 =$ $43 \times 9 =$ $78 \times 7 =$ $176 \times 4 =$	(2) $36 \times 7 =$ $12 \times 9 =$ $34 \times 6 =$ $134 \times 5 =$ $39 \times 7 =$	(3) $35 \times 8 =$ $45 \times 9 =$ $38 \times 7 =$ $187 \times 3 =$ $48 \times 9 =$	(4) $87 \times 7 =$ $34 \times 8 =$ $43 \times 9 =$ $344 \times 6 =$ $78 \times 11 =$
Total ==	Total ==	Total ==	Total ==

6. Complete.

(1) $234 + 67 =$ $456 + 87 =$ $654 + 98 =$ $435 + 87 =$ $654 + 91 =$	(2) $356 + 87 =$ $875 + 98 =$ $789 + 98 =$ $453 + 65 =$ $145 + 18 =$	(3) $876 + 99 =$ $987 + 67 =$ $456 + 98 =$ $432 + 45 =$ $543 + 19 =$	(4) $432 + 76 =$ $987 + 45 =$ $909 + 58 =$ $786 + 55 =$ $543 + 98 =$
Total ==	Total ==	Total ==	Total ==

7. Complete.

(1) $345 - 23 =$ $767 - 47 =$ $543 - 98 =$ $897 - 133 =$ $187 - 43 =$	(2) $456 - 76 =$ $432 - 33 =$ $435 - 78 =$ $434 - 244 =$ $876 - 87 =$	(3) $345 - 78 =$ $789 - 90 =$ $560 - 19 =$ $567 - 555 =$ $143 - 45 =$	(4) $432 - 43 =$ $432 - 87 =$ $432 - 87 =$ $590 - 186 =$ $111 - 67 =$
Total ==	Total ==	Total ==	Total ==

UNIT 2

FUNDAMENTAL OPERATIONS WITH FRACTIONS AND DECIMALS

ADDITION AND SUBTRACTION OF FRACTIONS

You will recall that a fraction is the expression of a part of a whole; for example, a butcher may buy a quarter of a beef; or the grocer, a half bushel of cucumbers. In actual business practice, it is frequently necessary to find the sum of several parts (addition), the remainder after a part is taken from a part (subtraction), the sum of several similar parts (multiplication), or a fraction of one of the parts (division).

In completing these operations, it is sometimes necessary to deal with mixed numbers such as $6\frac{1}{2}$. For addition and subtraction, we should deal with the whole numbers first. If the denominators of the fractions are different, they must be changed to a common denominator.

EXAMPLE— $\frac{2}{5}$ plus $\frac{1}{2}$ cannot be added in their present form, but when changed to

$\frac{4}{10}$ plus $\frac{5}{10}$, the problem is simplified.

Therefore, in adding $6\frac{3}{8} + 2\frac{1}{2}$, we first add the whole numbers — $6 + 2 = 8$.

Then, we convert the fractional parts to a common denominator — $\frac{4}{10} + \frac{5}{10} = \frac{9}{10}$, and the solu-

tion is 8 plus $\frac{9}{10}$ or $8\frac{9}{10}$

Subtraction is treated the same as addition, except that we subtract rather than add.

1. Complete the following exercises.

(1) $2\frac{2}{3} + 1\frac{1}{6} + 5\frac{5}{12}$	(2) $3\frac{1}{8} + 2\frac{1}{4} + 5\frac{1}{2}$	(3) $1\frac{3}{16} + 5\frac{5}{32} + 9\frac{3}{8}$
(4) $6\frac{1}{3} + 3\frac{1}{5} - 2\frac{1}{6}$	(5) $7\frac{1}{16} - 2\frac{3}{8} - 1\frac{3}{32}$	(6) $5\frac{2}{3} + 6\frac{4}{5} - 2\frac{5}{6}$
(7) $4\frac{3}{8} + 5\frac{7}{12} - 3\frac{1}{3}$	(8) $13\frac{3}{7} - 7\frac{5}{6} + 2\frac{3}{4}$	(9) $14\frac{3}{8} - 2\frac{5}{7} + 6\frac{1}{3}$

Multiplication of Fractions

EXAMPLE 1—Proper Fractions: $\frac{2}{5} \times \frac{15}{16} = \frac{\cancel{2}}{\cancel{5}} \times \frac{1\cancel{5}}{\cancel{8}} = \frac{3}{8}$

NOTE—Cancel numerators and denominators when possible before multiplying them.

EXAMPLE 2—Mixed Numbers: $6\frac{1}{4} \times 3\frac{2}{5} = \frac{2\cancel{5}}{4} \times \frac{17}{\cancel{5}} = \frac{85}{4} = 21\frac{1}{4}$

NOTE—First, turn the mixed numbers into improper fractions and then multiply the numerators and denominators.

EXAMPLE 3—A whole number by a mixed number: $22 \times 8\frac{1}{2}$

NOTE—Multiply by 8 and then by $\frac{1}{2}$ and add.
See the solution to the right.

$$\begin{array}{r} 22 \\ \times 8\frac{1}{2} \\ \hline 176 \\ \frac{11}{2} \\ \hline 187 \end{array}$$

1. Multiply.

(1) $\frac{3}{15} \times \frac{5}{9}$	(2) $6\frac{1}{4} \times 5\frac{3}{5}$	(3) $13\frac{1}{5} \times 2\frac{2}{5} \times 1\frac{1}{5}$	(4) $7\frac{1}{5} \times 2\frac{4}{5} \times 1\frac{2}{5}$
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Division of Fractions

EXAMPLE 1—Proper fractions: $\frac{4}{5} \div \frac{3}{10} = \frac{4}{\cancel{5}} \times \frac{10}{3} = \frac{8}{3} = 2\frac{2}{3}$

NOTE—Invert the *divisor* and proceed as in multiplication.

EXAMPLE 2—Mixed Numbers: $4\frac{3}{8} \div 3\frac{1}{4} = \frac{35}{8} \div \frac{15}{4} = \frac{3\cancel{5}}{8} \times \frac{4}{1\cancel{5}} = \frac{7}{2} = 3\frac{1}{2}$

NOTE—Change to improper fractions first and then proceed as in Example 1.

2. Divide.

(1) $\frac{3}{4} \div \frac{3}{8}$	(2) $3\frac{1}{5} \div 7\frac{1}{4}$	(3) $4\frac{3}{4} \div 2\frac{5}{8}$	(4) $12\frac{1}{2} \div 4\frac{3}{8}$
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MIXED OPERATIONS WITH FRACTIONS

When several numbers or fractional numbers are joined by different signs, the order of operations is as follows:

1. Complete the bracketed operations first.
2. Complete the operations connected by "of" second. (Multiply.)
3. Complete the multiplication and division in order of occurrence next.
4. Complete the addition and subtraction in order of occurrence last.

EXAMPLE—Simplify: $\frac{1}{6} + \frac{1}{3} \div \frac{1}{2} \text{ of } \frac{3}{5} \times \frac{1}{6} \div \frac{2}{3} \times \frac{7}{10} - \frac{2}{5}$

Step One: $\frac{1}{6} + \frac{1}{3} \div \frac{3}{10} \times \frac{1}{6} \div \frac{2}{3} \times \frac{3}{10}$ (The "of" signs, and brackets are reduced as shown.)

Step Two: $\frac{1}{6} + \frac{1}{3} \times \frac{10}{3} \times \frac{1}{6} \times \frac{3}{2} \times \frac{3}{10}$ (Multiplication and division are completed.)

Step Three: $\frac{1}{6} + \frac{1}{12} = \frac{2}{12} + \frac{1}{12} = \frac{3}{12} = \frac{1}{4}$ (Addition is completed.)

1. Complete the following mixed operations.

(1) $\frac{2}{3} \times \frac{1}{5} \text{ of } \frac{3}{4}$	(2) $\frac{3}{8} \text{ of } \frac{4}{9} \div \frac{5}{6}$	(3) $\frac{3}{8} + \frac{1}{2} \text{ of } \frac{3}{4}$	(4) $\frac{7}{8} \text{ of } \left(\frac{3}{4} + \frac{7}{8}\right)$
(5) $\frac{3}{4} + \frac{5}{6} \div \frac{3}{4} \times \frac{3}{8} - \frac{7}{8}$	(6) $\frac{5}{8} + \frac{1}{5} \text{ of } \left(\frac{1}{6} + \frac{3}{4}\right) \times \left(\frac{7}{8} - \frac{2}{3}\right)$	(7) $\frac{3}{4} \div \frac{1}{8} \text{ of } \frac{2}{3} + \frac{1}{6} \text{ of } \frac{3}{8}$	
(8) $\frac{5}{8} + \frac{3}{16} \text{ of } \frac{8}{9} \div \frac{1}{5} \text{ of } \left(\frac{2}{3} + \frac{3}{8}\right)$	(9) $\frac{7}{8} - \frac{1}{8} \text{ of } \frac{3}{4} - \frac{1}{6} \text{ of } \left(\frac{1}{8} + \frac{1}{4}\right)$	(10) $\left(\frac{3}{4} - \frac{3}{8}\right) \div \frac{1}{8} - \frac{1}{4} \text{ of } \frac{3}{8}$	

REDUCING COMPLEX FRACTIONS

A complex fraction is one whose numerator or denominator, or both, are fractions. In certain problems, it is necessary to reduce these to simple fractions.

EXAMPLE—Reduce the complex fraction $\frac{4\frac{3}{8}}{5\frac{1}{4}}$.

$$\frac{4\frac{3}{8}}{5\frac{1}{4}} = \frac{\frac{35}{8}}{\frac{21}{4}} = \frac{35}{8} \times \frac{4}{21} = \frac{5}{6}$$

1. Reduce the following complex fractions to their simplest form.

(1) $\frac{\frac{3}{8}}{\frac{5}{6}}$	(2) $\frac{\frac{1}{2} + \frac{1}{3}}{\frac{5}{6} - \frac{1}{2}}$	(3) $\frac{5\frac{1}{2}}{300 \times \frac{3}{5}}$	(4) $\frac{\frac{1}{3} \text{ of } 6\frac{3}{8}}{5\frac{2}{3} \div \frac{3}{5}}$
(5) $\frac{\frac{4}{5}}{5 - \frac{2}{3}}$	(6) $\frac{5\frac{1}{3} - \frac{1}{8}}{\frac{1}{3} \text{ of } 3\frac{1}{6}}$	(7) $\frac{5\frac{3}{4} \div \frac{5}{8}}{8}$	(8) $\frac{150 \times \frac{7}{20} \text{ of } \frac{3}{5}}{\frac{1}{2} \text{ of } 3\frac{1}{8}}$
(9) $\frac{5\frac{3}{4}}{\frac{65}{1000} \times \frac{3}{5}} + \frac{6\frac{1}{4}}{\frac{3}{4} \times \frac{7}{200}}$		(10) $\frac{12\frac{1}{2}}{\frac{5}{200} \times 180} + \frac{6\frac{3}{5}}{\frac{55}{1000} \times 375}$	

DECIMAL FRACTIONS

The office worker must be able to perform the same fundamental operations with decimal fractions as with common fractions and whole numbers. The following brief summary will serve to recall the proper methods of dealing with these operations.

1. **ADDITION AND SUBTRACTION:** Align the decimal points vertically and proceed as with whole numbers.
2. **MULTIPLICATION:** Multiply as with whole numbers, but put as many decimal places in the answer as the sum of the decimal places in the two numbers which have been multiplied together.
3. **DIVISION:** Move the decimal point to the right far enough in *both* the divisor and the dividend to make the divisor a whole number. Divide as with whole numbers, but when the division requires bringing down a number to the right of the decimal place in the dividend, place a decimal point in the answer.

In addition to the above fundamental operations, it is frequently necessary to express common fractions as decimal fractions, and decimal fractions as common fractions.

1. **TO EXPRESS DECIMAL NUMBERS AS FRACTIONS:** Form a fraction by using the decimal number as the numerator, and 1 followed by a 0 for each place of decimals in the number for the denominator.
2. **TO EXPRESS FRACTIONS AS DECIMAL FRACTIONS:** Divide the numerator by the denominator.

1. Add.

(1) 63.271	(2) 23.671	(3) 6.2714	(4) 261.003
4.23	1.06	31.2	27.
16.854	13.005	1.0016	31.02
33.298	2.197	3.6197	27.0005
56.2	261.298	15.02	16.2134
3.785	37.01	13.21	161.75
271.239	23.096	.0371	37.0125
63.	171.298	1.0009	151.0222
1.298	71.201	.236	1.6
27.219	26.	14.2306	.306
<hr/>	<hr/>	<hr/>	<hr/>

2. Subtract.

(1) 62.318	(2) 36.0125	(3) 8.71230	(4) 5.62031
.197	.0256	5.60	.00371
<hr/>	<hr/>	<hr/>	<hr/>
(5) 23.34568	(6) 3.09874	(7) 1.00001	(8) 23456.091
19.34569	.004555	.99999	13457.007
<hr/>	<hr/>	<hr/>	<hr/>

DECIMAL FRACTIONS

1. Multiply.

$$\begin{array}{r} (1) \quad 62.318 \\ \quad .197 \\ \hline \end{array}$$

$$\begin{array}{r} (2) \quad 71.2309 \\ \quad .0239 \\ \hline \end{array}$$

$$\begin{array}{r} (3) \quad .685128 \\ \quad .3417 \\ \hline \end{array}$$

$$\begin{array}{r} (4) \quad 23.0068 \\ \quad 1.936 \\ \hline \end{array}$$

2. Divide.

$$(1) \quad 26 \overline{)1071.98}$$

$$(2) \quad 1.35 \overline{)361.530}$$

$$(3) \quad .279 \overline{).056079}$$

3. Divide and find the answer correct to two places of decimals.

$$(1) \quad 73 \overline{)23671}$$

$$(2) \quad 2.13 \overline{)75.34}$$

$$(3) \quad .019 \overline{)36.317}$$

4. Express as fractions.

$$(1) \quad .25$$

$$(2) \quad .37$$

$$(3) \quad .125$$

$$(4) \quad 4.25$$

$$(5) \quad 7.163$$

$$(6) \quad 5.375$$

5. Express as decimal fractions.

$$(1) \quad \frac{3}{4}$$

$$(2) \quad \frac{5}{8}$$

$$(3) \quad \frac{7}{12}$$

$$(4) \quad \frac{4}{5}$$

$$(5) \quad \frac{3}{16}$$

$$(6) \quad \frac{15}{16}$$

PROBLEMS

Whenever a part or a multiple of a number is known or can be determined, it is possible to find the whole number.

EXAMPLE—The profit on a transaction is \$50, which is $\frac{2}{5}$ of the amount involved.

What is the amount?

$\frac{2}{5}$ amounts to \$50.

Therefore, $\frac{1}{5}$ would be $\frac{50}{2}$.

The whole amount is $\frac{5}{5}$ or $\frac{50}{2} \times 5$, which is \$125.

Note that the answer is secured by dividing the amount known, \$50, by the fraction that it is of the whole amount.

EXAMPLE—\$35 is $\frac{5}{7}$ of the profit on a transaction. What is the whole profit?

Because $\frac{5}{7} = \$35$, $\frac{7}{7} = \$35 \div \frac{5}{7} = \$35 \times \frac{7}{5} = \49 .

1. Calculate the whole number in each of the following exercises.

(1) $\frac{1}{3}$ of a number is 14.	(2) $\frac{3}{5}$ of a number is 9.	(3) $\frac{5}{8}$ of a number is 35.
(4) $\frac{6}{5}$ of a number is 90.	(5) $1\frac{3}{4}$ of a number is 28.	(6) $3\frac{1}{2}$ of a number is 49.
(7) .5 of a number is 27.	(8) .8 of a number is 56.	(9) .17 of a number is 51.
(10) 1.3 of a number is 39.	(11) $\frac{5}{4}$ of a number is 45.	(12) $\frac{1}{40}$ of a number is 22.
<p>2. A student has sold 63 football tickets, but has $\frac{3}{10}$ of his supply left. How many did he have originally?</p>		<p>3. A family spends $\frac{1}{5}$ of its monthly income for rent, $\frac{1}{3}$ for food, $\frac{1}{12}$ for clothing, $\frac{1}{10}$ for insurance, and $\frac{3}{20}$ for miscellaneous items, and saves \$40 a month. (a) What is the monthly income? (b) How much is spent on each item?</p>
<p>4. An office manager estimates that it will take 3 girls 6 days to type a list of addresses. How long will it take if he puts 6 girls on the job?</p>		<p>5. Twenty-four men can do an earth removal job in 16 days. If the job has to be completed in 12 days to meet a contract date, how many men must be hired?</p>

PROBLEMS

6. In the World Series, the following players were among those who participated. Calculate their batting averages in decimal fractions correct to three places of decimals.

PLAYER'S NAME	TIMES AT BAT	NO. OF HITS	COMMON FRACTION	DECIMAL FRACTION	PLAYER'S NAME	TIMES AT BAT	NO. OF HITS	COMMON FRACTION	DECIMAL FRACTION
Bauer	18	1			Cox	27	8		
Rizzuto	27	4			Reese	29	10		
Mantle	29	10			Robinson	23	4		
Berra	28	6			Campanella	28	6		
Collins	12	0			Pafko	21	4		
Noren	10	3			Hodges	21	0		
McDougald	25	5			Furillo	23	4		
Martin	23	5			Shuba	10	3		
Woodling	23	8			Raschi	6	1		
Mize	15	6			Lopat	3	1		

7. A \$150-a-week business executive takes 15 minutes to compose a letter and 5 minutes to dictate it to a \$60-a-week secretary, who takes 15 minutes to transcribe it. If the office works a 40-hour week, and postage and paper cost 7 cents, what is the cost of the letter?

8. A drug is composed of .2 Zinc Undecylenade, .02 Undecylenic Acid, and .78 Talc. How many ounces of each are there in a 5-pound package?

9. On his vacation, a man drives an average of 250 miles a day, using gasoline at the rate of one gallon for every $24\frac{1}{2}$ miles travelled. If gasoline costs $41\frac{1}{2}$ cents a gallon, and he drives for 17 days, what is (a) The cost of gasoline for the trip? (b) The gasoline cost per mile?

10. Calculate the total of the following invoice.

6 boxes of Butter weighing $182\frac{1}{2}$, 179, $163\frac{3}{4}$, $157\frac{1}{2}$, $169\frac{3}{4}$, and $181\frac{1}{2}$ lb. @ 49 cents a lb.

PROBLEMS

11. A city spends \$12,540.00 to operate a summer playground program for 44 days. If 9,500 children attend daily, what is the cost per day per child?

13. If the air parcel post rate from Toronto to Montreal is 25 cents a pound, and 5 cents an ounce on the excess weight over an even pound until the next pound is reached, what is the cost of sending the following parcels:

- (a) 7 pounds, 3 ounces?
- (b) 7 pounds, 8 ounces?
- (c) 9 pounds, 1 ounce?

15. A school has 6 typewriting rooms, with 40 typewriters in each room. If a typewriter ribbon costs \$1.25, and each machine requires 9 each year, what is the annual cost for ribbons?

12. A boy has an allowance of \$4.00 a week. If he spends $\frac{1}{5}$ on bus fare, $\frac{1}{10}$ on treats, and $\frac{1}{2}$ on lunches, how much can he save over a period of 2 years?

14. The air mail rate is 7 cents for the first ounce, and 5 cents for each additional ounce. What is the cost for the following:

- (a) A letter weighing 3 ounces?
- (b) A letter weighing 7 ounces?
- (c) A letter weighing 5 ounces?

16. A bus company charges 60 cents a mile and \$2.00 an hour for lay-over time to transport a football team. If the team travels to another city 53 miles away to play a game that lasts $2\frac{1}{2}$ hours, what is the charge for the bus?

PROBLEMS

17. The following table gives the hourly rates of pay and the hours worked by the employees of the Ajax Lumber Company. The company pays the men overtime at the rate of time and a half for any hours worked over 44 in a week. Calculate each man's pay and the total pay for all.

EMPLOYEE'S NAME	RATE	MON.	TUES.	WED.	THURS.	FRI.	SAT.	TOTAL REG.	TOTAL O.T.	REG. PAY	O.T. PAY	TOTAL PAY
S. Brown	1.10	8½	7½	9	8½	6½	4½					
B. Jones	1.20	5¾	9½	8½	8	9¼	5					
C. King	1.15	8	8¼	8½	8	8	4					
S. Leveque	1.30	8	8	7½	8	8	0					
D. Vascki	1.40	9	9¼	8	8½	8¾	5					
W. Wycoff	1.10	8	3	8¼	8¾	8	4					
Total Pay												

18. Calculate the total of the following invoice of yard goods.

10 pcs. measuring as follows: 12¼, 15¾, 11¼, 13½, 14¼, 12⅞, 15¾, 13¾, 12½, 10¾ yd. at 1.19 a yard.

19. A sample of ore is made up as follows: .003 gold, .0016 platinum, .023 silver, .063 lead, .031 zinc, and the balance is waste rock. How many pounds of each mineral would there be in a ton of the ore?

20. A plumber takes 15 minutes to reach a job, spends 2½ hours on it, and uses 37 feet of pipe at 65 cents a foot, 5 elbows at 75 cents each, and 2 unions at \$2.25 each. If he charges \$4.50 an hour for his time until he returns to his shop, what will be the amount of the bill?

21. A merchant bought 200 suits for \$15 each. He sold ⅓ of them for \$27.50 each, ⅓ for \$26.50 each, ⅓ for \$19.95, and the balance for \$17.50 each. What was his profit on the transaction?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Add.

(1)	(2)	(3)	(4)	(5)
2368.75	4698.46	3656.49	2236.65	6665.46
4669.63	2307.59	4699.27	5667.17	3987.62
6546.09	5987.77	3728.88	9876.54	2345.98
3029.76	6096.69	8609.23	1234.56	8765.43
4996.67	4169.73	3644.29	7890.12	3005.56
3258.83	2198.88	6056.61	3456.75	6079.29

2. Multiply.

(1)	(2)	(3)	(4)
23.61282 7	63.8564 .08	45.6391 .004	37.9138 .0011

3. Divide.

(1)	(2)	(3)	(4)
7) 44.2295	9) .590688	.6) 2677962	8) 18.5160

4. Calculate the extensions and totals of the following invoices.

(1)	(2)	(3)
44 items @ .09	71 items @ 1.01	231 items @ .12
25 " " .44	49 " " .99	123 " " .09
75 " " .36	612 " " 1.11	48 " " .25
50 " " .27	24 " " 1.02	36 " " .06
47 " " .50	209 " " .12	101 " " .97
Total	Total	Total

5. Express as decimals.

6. Express as fractions.

$\frac{1}{4}$	$\frac{1}{12}$	$\frac{1}{5}$	.2	.8	.41
$\frac{1}{8}$	$\frac{3}{4}$	$\frac{4}{5}$	.25	.125	.66 $\frac{2}{3}$
$\frac{3}{8}$	$\frac{1}{6}$	$\frac{3}{10}$	.4	.33 $\frac{1}{3}$	.75
$\frac{5}{8}$	$\frac{2}{3}$	$\frac{3}{5}$	.45	.7	.6
$\frac{7}{8}$	$\frac{5}{6}$	$\frac{3}{16}$	.625	.0625	.1
$\frac{1}{3}$	$\frac{1}{16}$	$\frac{11}{12}$	.9	.875	.375

UNIT 3

PERCENTAGE

PER CENTS AND FRACTIONS

In business and in many other situations, quantities are frequently expressed in relationship to 100 for ease of comparison. The term per cent means per hundred or hundredths. A per cent, therefore, is a fraction of 100.

EXAMPLE—Express $\frac{3}{4}$ as a per cent.

$$\frac{3}{4} \times 100 = 75\%$$

EXAMPLE—Express 7% as a fraction.

$$7\% \times \frac{1}{100} = \frac{7}{100}$$

1. Express the following fractions as per cents.

(1) $\frac{1}{4}$	(2) $\frac{1}{7}$	(3) $\frac{3}{7}$	(4) $\frac{1}{18}$	(5) $\frac{1}{24}$	(6) $\frac{5}{17}$
(7) $\frac{1}{40}$	(8) $\frac{3}{40}$	(9) $\frac{16}{108}$	(10) $3\frac{1}{2}$	(11) $2\frac{1}{3}$	(12) $5\frac{1}{3}$

2. Express the following per cents as common fractions.

(1) 15%	(2) 123%	(3) $5\frac{1}{2}\%$	(4) $11\frac{1}{2}\%$	(5) $7\frac{1}{4}\%$	(6) $\frac{1}{3}\%$
(7) $1\frac{1}{2}\%$	(8) $2\frac{3}{4}\%$	(9) $36\frac{9}{10}\%$	(10) $212\frac{1}{2}\%$	(11) $3\frac{1}{3}\%$	(12) $100\frac{1}{3}\%$

There are some percentages which occur more frequently than others in business calculations, and you should be able to convert quickly many of the common per cents to their equivalent fractions, and the fractions to per cents.

3. Complete the following table.

FRACTION	PER CENT	FRACTION	PER CENT	FRACTION	PER CENT
1. $\frac{1}{2}$		11. $\frac{5}{6}$		21. $\frac{9}{10}$	
2. $\frac{1}{3}$		12. $\frac{1}{7}$		22. $\frac{1}{11}$	
3. $\frac{2}{3}$		13. $\frac{1}{8}$		23. $\frac{1}{12}$	
4. $\frac{1}{4}$		14. $\frac{3}{8}$		24. $\frac{5}{12}$	
5. $\frac{3}{4}$		15. $\frac{5}{8}$		25. $\frac{7}{12}$	
6. $\frac{1}{5}$		16. $\frac{7}{8}$		26. $\frac{11}{12}$	
7. $\frac{2}{5}$		17. $\frac{1}{9}$		27. $\frac{1}{15}$	
8. $\frac{3}{5}$		18. $\frac{1}{10}$		28. $\frac{1}{16}$	
9. $\frac{4}{5}$		19. $\frac{3}{10}$		29. $\frac{3}{16}$	
10. $\frac{1}{6}$		20. $\frac{7}{10}$		30. $\frac{1}{20}$	

PER CENTS AND DECIMAL FRACTIONS

EXAMPLE 1—Express 7% as a decimal.

Divide 7 by 100 = .07

EXAMPLE 3—Express .25 as a per cent.

Move the decimal point 2 spaces to the right.

.25 = 25%

EXAMPLE 2—Express $11\frac{1}{2}\%$ as a decimal.

$11.5 \div 100 = .115$

NOTE—

To divide by 100, move the decimal point 2 places to the left.

1. Express the following as decimal fractions or per cents.

3%	$2\frac{1}{2}\%$	$17\frac{3}{4}\%$	115%	$\frac{1}{2}\%$	$\frac{3}{4}\%$
.35	.78	.42	.355	.875	.625
$44\frac{1}{4}\%$	717%	$29\frac{1}{8}\%$	$35\frac{1}{16}\%$	$1\frac{1}{2}\%$	$\frac{1}{8}\%$
3.45	1.34	.07	$.06\frac{1}{2}$	.00125	1.0025

EXAMPLE—Calculate 8 per cent of 150.

SOLUTION 1—Fractional Method—Express 8% as a common fraction and multiply by 150.

$$\frac{8}{100} \times 150 = 12$$

SOLUTION 2—Decimal Method —Express 8% as a decimal fraction and multiply by 150.

$$.08 \times 150 = 12$$

SOLUTION 3—1 per cent Method—Calculate 1 per cent of 150 by moving the decimal point 2 places to the left and multiply by 8. This method is most convenient for finding small percentages such as 2, 3, $\frac{1}{2}\%$ etc.

$$8 \times 1.50 = 12$$

2. Complete the following calculations.

(1) 5% of \$345.00	(2) 9% of \$375.00
(3) 25% of \$45.00	(4) $8\frac{1}{4}\%$ of \$750.00
(5) 135% of \$63.50	(6) 19% of \$432.00
(7) $45\frac{1}{4}\%$ of \$87.50	(8) $1\frac{1}{4}\%$ of \$975.50
(9) $\frac{1}{2}\%$ of \$3450.00	(10) $\frac{1}{8}\%$ of \$342.00

CALCULATIONS IN PERCENTAGE

EXAMPLE—What per cent is 15 pounds of 200 pounds?

Place 15 over 200 and multiply by 100.

$$15/200 \times 100 = 7\frac{1}{2}\%.$$

1. Calculate what per cent the first number is of the second.

(1) 5 lb. of 15 lb.	(2) $37\frac{1}{2}$ lb. of 300 lb.	(3) 25 ft. of 375 ft.
(4) $2/5$ of $1/2$	(5) 18 planes of 200 planes	(6) $3/8$ of $3\frac{1}{4}$
(7) 12 yd. of 144 yd.	(8) $2\frac{1}{2}$ oz. of $27\frac{1}{2}$ oz.	(9) .7 of 3.5
(10) 9 men of 45 men	(11) 21% of 63%	(12) \$35 of \$175

EXAMPLE—5 per cent of a sum of money is \$45. What is the sum?

$$5 \text{ per cent} = \$45.$$

$$\text{Therefore, } 1 \text{ per cent} = \$45 \div 5 = \$9.00.$$

$$\text{And } 100 \text{ per cent} = \$9.00 \times 100 = \$900.$$

2. In each of the following, calculate 100 per cent.

(1) 3% of a sum is \$15	(2) 60% of a sum is \$120	(3) 8% of a sum is \$248
(4) $\frac{1}{2}\%$ of a sum is \$17.00	(5) $5\frac{1}{2}\%$ of a sum is \$550	(6) 120% of a sum is \$480
(7) 102% of a sum is \$765	(8) $\frac{1}{3}\%$ of a sum is \$2.11	(9) $100\frac{1}{4}\%$ of a sum is \$465.16
(10) 98% of a sum is \$359.70	(11) 9% of a sum is \$38.79	(12) 72.2% of a sum is \$119.13

PERCENTAGE

There are frequently situations where the arithmetical operation is simplified if a per cent or a common fraction is converted to a decimal fraction, or if a decimal fraction is converted to a common fraction.

1. Convert the following to decimal fractions and multiply.

(1) 12% of 118	(2) 17% of $12\frac{1}{2}$	(3) 14% of 117	(4) 3.5% of 11.2	(5) $9\frac{1}{4}$ % of $8\frac{1}{2}$	(6) $2\frac{1}{3}$ % of 19
(7) 71% of 141	(8) 69% of 142	(9) $18\frac{1}{4}$ % of 195	(10) 20.7% of 915	(11) 14.5% of 97	(12) 118% of 615

2. Multiply the following by converting to simple fractions.

(1) $.25 \times 24$	(2) $33\frac{1}{3}$ % of 33	(3) 5% of 40	(4) $12\frac{1}{2}$ % of 48	(5) $.875 \times 32$	(6) $.66\frac{2}{3} \times 45$
(7) $.75 \times 36$	(8) $.5 \times 324$	(9) $.16\frac{2}{3} \times 36$	(10) $.40 \times 35$	(11) $37\frac{1}{2}$ % of 56	(12) $6\frac{1}{4}$ % of 32

What you have learned here in converting decimal fractions to common fractions is valuable in short methods of calculation in invoicing.

3. Using equivalent fractions, calculate the extensions in the following invoices and total.

12 $\frac{1}{2}$ lb. (1) @ \$.40			37 $\frac{1}{2}$ yd. (2) @ \$.32			48 bu. (3) @ \$1.25		
33 $\frac{1}{3}$ " " .60			66 $\frac{2}{3}$ " " .96			62 " " 1.50		
20 " " .60			75 " " .44			24 " " 2.50		
50 " " .62			16 $\frac{2}{3}$ " " .48			33 " " 1.33 $\frac{1}{3}$		
25 " " .44			87 $\frac{1}{2}$ " " .64			72 " " 1.08 $\frac{1}{3}$		
Total			Total			Total		

PROBLEMS INVOLVING EQUIVALENT FRACTIONS

1. Calculate the extensions in the following invoices, using fractional equivalents when possible.
Total each invoice.

(1)

36 lb. @ \$1.25				
15 " " .20				
96 " " $.08\frac{1}{3}$				
44 " " .75				
25 " " .40				
Total				

(2)

24 yd. @ \$1.12 $\frac{1}{2}$				
39 " " $.33\frac{1}{3}$				
40 " " $.87\frac{1}{2}$				
32 " " $.06\frac{1}{4}$				
56 " " $.37\frac{1}{2}$				
Total				

(3)

48 lb. @ \$ $.37\frac{1}{2}$				
50 " " .78				
36 " " 1.50				
48 " " $.42\frac{2}{3}$				
12 $\frac{1}{2}$ " " 1.60				
Total				

(4)

24 yd. @ \$1.75				
25 " " 1.20				
32 " " $1.12\frac{1}{2}$				
75 " " $1.33\frac{1}{3}$				
48 " " $1.37\frac{1}{2}$				
Total				

(5)

42 lb. @ \$ $.16\frac{2}{3}$				
18 " " $.33\frac{1}{3}$				
64 " " $.37\frac{1}{2}$				
56 " " $.12\frac{1}{2}$				
28 " " .25				
Total				

(6)

12 yd. @ \$ $.83\frac{1}{3}$				
25 " " .88				
80 " " $.87\frac{1}{2}$				
90 " " $.66\frac{2}{3}$				
16 " " $.87\frac{1}{2}$				
Total				

(7)

132 gal. @ \$1.08 $\frac{1}{3}$				
45 " " .20				
24 " " $.58\frac{1}{3}$				
48 " " $.37\frac{1}{2}$				
27 " " $.66\frac{2}{3}$				
Total				

(8)

54 lb. @ \$ $.16\frac{2}{3}$				
66 " " .50				
36 " " $.91\frac{2}{3}$				
24 " " $.83\frac{1}{3}$				
85 " " .20				
Total				

(9)

36 yd. @ \$1.08 $\frac{1}{3}$				
88 " " .25				
84 " " $.41\frac{2}{3}$				
52 " " .50				
69 " " $.33\frac{1}{3}$				
Total				

(10)

25 yd. @ \$ $.12\frac{1}{2}$				
33 " " $.12\frac{1}{2}$				
34 " " $.12\frac{1}{2}$				
35 " " $.12\frac{1}{2}$				
67 " " $.12\frac{1}{2}$				
Total				

(11)

16 lb. @ \$ $.33\frac{1}{3}$				
25 " " $.33\frac{1}{3}$				
28 " " $.33\frac{1}{3}$				
46 " " $.33\frac{1}{3}$				
31 " " $.33\frac{1}{3}$				
Total				

(12)

16 yd. @ \$ $.66\frac{2}{3}$				
28 " " $.66\frac{2}{3}$				
34 " " $.66\frac{2}{3}$				
46 " " $.66\frac{2}{3}$				
22 " " $.66\frac{2}{3}$				
Total				

(13)

16 lb. @ \$ $.06\frac{1}{4}$				
17 " " $.06\frac{1}{4}$				
18 " " $.06\frac{1}{4}$				
16 " " .25				
96 " " $.08\frac{1}{3}$				
Total				

(14)

36 yd. @ \$1.25				
36 " " 1.50				
36 " " 1.75				
32 " " $1.37\frac{1}{2}$				
48 " " $1.12\frac{1}{2}$				
Total				

(15)

28 lb. @ \$ $.14\frac{7}{8}$				
33 " " $.09\frac{1}{11}$				
27 " " $.11\frac{1}{8}$				
90 " " .05				
44 " " .15				
Total				

PROBLEMS IN PERCENTAGE

1. A fruit dealer purchased 1,200 pounds of bananas at 8¢ a pound. He lost 9% (by weight) through over-ripening. He sold the balance at 2 lb. for 29¢. What was his profit?

2. A chicken farmer set 1,000 dozen eggs for hatching. 91% of the eggs hatched. 3% of the chicks died before shipping. How many did he ship?

3. An inspector in a plant receiving department rejected 108 out of 800 castings delivered. What per cent was rejected?

4. In the packing department of a glass factory, an inspector rejected 390 bottles in an 8-hour shift. This was $4\frac{1}{3}\%$ of the bottles made. How many bottles were made during the 8-hour shift?

5. A single person pays an income tax of 18.5% on his income over \$1,000. What tax for the year would he pay on an income of \$35 a week?

6. A single person paid a tax on his income over \$1,000 of \$131.35 when the rate was 18.5%. What was his total income?

7. The bonded debt of a city was reduced in ten years from \$27,400,000 to \$13,800,000. By what per cent was it reduced?

8. In a school of 974 students, 63 proved positive to a T.B. test. If 14 students were absent on the day of the test, what per cent of those tested reacted positively?

PROBLEMS IN PERCENTAGE

9. In a recent election, where 69,350 people were eligible to vote, 41% voted for one party, 11.2% voted for a second party, and 1.9% voted independent. How many failed to vote? (Calculate to the nearest whole number.)

10. In a set of tests, a student got 43 marks out of 70 in Subject A, 37 marks out of 50 in Subject B, and 36 marks out of 55 in Subject C. What was: (a) his per cent in each subject? (b) His average per cent?

11. Eight men can complete 20% of a job in 50 days. How many men will it take to complete the job in 30 days?

12. A firm purchased 20 suits for \$18.50 each. It marked them up 50%, and sold 8 at this price. It then marked the selling price down 10% and sold 10 more. It sold the others at cost price. What was the profit on the transaction?

13. A firm's gross profit was \$34,315. Of this \$18,000 was paid out in wages; \$3,560, in taxes; \$1,250, in advertising; \$4,575, in office expense; and the balance was profit. What per cent is each of the gross profit?

14. A clerk is paid \$35 a week and a commission of $1\frac{1}{2}\%$ on sales. What is her income for a week when the sales are \$175, \$123, \$95, \$124, \$111, \$208, respectively for Monday to Saturday?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Calculate as indicated.

(1) .25 of 144 =
 .10 of 121 =
 .75 of 64 =
 .11 of 68 =
 .4 of 61 =

Total

(2) .19 of 14 =
 .27 of 16 =
 .68 of 23 =
 .31 of 41 =
 .60 of 42 =

Total

(3) .125 of 96 =
 .03 of 22 =
 .05 of 27 =
 .08 of 121 =
 .075 of 72 =

Total

2. Calculate as indicated.

(1) 12% of \$165.00 =
 15% of 210.00 =
 9% of 140.00 =
 18% of 285.00 =
 24% of 162.00 =

(2) 5% of \$140.00 =
 6% of 210.00 =
 7% of 145.00 =
 9% of 218.00 =
 10% of 143.85 =

(3) $\frac{1}{8}\%$ of \$240.00 =
 $\frac{1}{4}\%$ of 215.00 =
 $\frac{1}{2}\%$ of 366.00 =
 $\frac{1}{6}\%$ of 144.00 =
 $\frac{1}{2}\%$ of 375.00 =

3. In the following, find the Net Profit, and what per cent the Net Profit and each item of expense is of the Gross Trading Profit.

(1)

Gross Trading Profit	\$8400.00	PER CENT
<i>Expenses</i>		
Rent	\$ 120.00	
Salaries	4800.00	
Taxes	270.00	
Supplies	240.00	
Depreciation	150.00	
Advertising	900.00	
Total Expense		
Net Profit		

(2)

Gross Trading Profit	\$9600.00	PER CENT
<i>Expenses</i>		
Advertising	\$1200.00	
Repairs	180.00	
Wages	4000.00	
Taxes	2700.00	
Delivery	900.00	
Depreciation	800.00	
Total Expense		
Net Profit		

4. If $\frac{1}{8}$ per cent is deducted for all cheques, calculate the net deposit in each of the following cases.

(1)

1125 × \$ 1		
61 × 2		
29 × 5		
43 × 10		
18 × 20		
Silver	122	83
Copper	3	89
Cheques		
Royal	180	00
Imperial	219	00
Total		
Exchange		
Net Deposit		

(2)

813 × \$ 1		
193 × 2		
97 × 5		
168 × 10		
91 × 20		
Silver	114	45
Copper	9	50
Cheques		
Dominion	208	00
Provincial	275	50
Total		
Exchange		
Net Deposit		

UNIT 4

APPLICATIONS OF PERCENTAGE

CASH AND TRADE DISCOUNTS

Cash Discounts are frequently allowed on invoices for prompt payment. For example, on electric light bills, the Utilities Commission allows a 10 per cent discount if the bill is paid within 20 days.

EXAMPLE 1—What amount will settle a bill for \$15.90 if 10% is allowed as a cash discount?

Gross amount of bill	\$15.90
Discount, 10%	1.59
Net amount of bill	<u>\$14.31</u>

EXAMPLE 2—An invoice of goods amounting to \$371 is sold on October 13. The terms are 2% off if paid in 10 days, the full amount to be paid in 30 days (2/10, n/30). What amount will settle the bill on October 20?

Gross amount of bill	\$371.00
Discount	7.42
Net amount of bill	<u>\$363.58</u>

1. Complete the following table.

DATE SOLD	AMOUNT	TERMS	PAID	DISCOUNT				PAYMENT				CALCULATIONS
Oct. 25	\$ 140.00	2/10, n/30	Oct. 30									
Oct. 29	115.00	3/10, n/60	Nov. 8									
Nov. 5	85.00	2/10, n/30	Dec. 5									
Nov. 6	215.00	2/10, n/30	Nov. 20									
Nov. 15	62.45	1/10, n/30	Nov. 24									
Dec. 1	35.54	3/10, n/30	Dec. 9									
Dec. 3	162.94	2/20, n/60	Dec. 12									
Dec. 6	19.29	10/20, n/30	Dec. 26									
Dec. 12	1423.62	1/10, n/30	Dec. 20									
Dec. 15	117.65	1/10, n/30	Dec. 24									

A *trade discount* is a deduction in the billed price of merchandise given to a certain classification of purchasers, such as wholesalers and retailers. For example, a manufacturer may allow the retailer a 25 per cent discount, and the wholesaler, the 25 per cent and an additional 10 per cent discount.

EXAMPLE 1—A manufacturer allows 30 per cent off on sales to retailers.

Calculate the cost of 100 brooms at \$1.19.

100 Brooms at \$1.19—	\$119.00
Less 30%	<u>35.70</u>
	<u>\$83.30</u>

EXAMPLE 2—A manufacturer allows 30 per cent and 20 per cent off on sales to wholesalers.

Calculate the cost of 100 brooms at \$1.19.

100 Brooms at \$1.19—	\$119.00
Less 30%	<u>35.70</u>
	<u>83.30</u>
Less 20%	<u>16.66</u>
	<u>\$66.64</u>

A *quantity discount* is granted when a buyer can purchase in large quantities. If this discount takes the form of a per cent, it is calculated in the same way as a trade discount.

CASH AND TRADE DISCOUNTS

1. Calculate the net amount of each invoice.

(1) Amount of Invoice \$ 35.00	(2) Amount of Invoice \$415.00	(3) Amount of Invoice \$125.00
Less 20%	Less 10%	Less 30%
Less 5%	Less 10%	Less 10%
(4) Amount of Invoice \$119.00	(5) Amount of Invoice \$ 75.00	(6) Amount of Invoice \$315.65
Less 25%	Less 40%	Less 15%
Less 5%	Less 10%	Less 5%
(7) Amount of Invoice \$675.80	(8) Amount of Invoice \$245.15	(9) Amount of Invoice \$ 32.50
Less 40%	Less 20%	Less 10%
Less 15%	Less 5%	Less 5%
(10) Amount of Invoice \$ 68.45	(11) Amount of Invoice \$ 95.75	(12) Amount of Invoice \$325.80
Less 30%	Less 20%	Less 33 $\frac{1}{3}$ %
Less 12 $\frac{1}{2}$ %	Less 5%	Less 10%
(13) Amount of Invoice \$322.50	(14) Amount of Invoice \$112.85	(15) Amount of Invoice \$115.00
Less 33 $\frac{1}{3}$ %	Less 20%	Less 10%
Less 25%	Less 10%	Less 5%
Less 10%	Less 5%	Less 2%

(16) 24 Fielder's Gloves A64 at \$20.00, less 25%		
12 Trapper Gloves A632 " 27.50, " 15%		
60 Baseball bats BL35 " 3.25, " 40%		
20 Face Guards AX119 " 16.50, " 33 $\frac{1}{3}$ %		
12 Body Protectors M56 " 7.50, " 30%		
Total		

TRADE DISCOUNTS

EXAMPLE—Find a single discount equal to discounts of 20% and 10%.

SUBTRACTION METHOD—

$$\begin{array}{r} \text{List Price} \dots\dots\dots 100\% \\ \text{Less } 20\% \dots\dots\dots 20\% \\ \hline \phantom{\text{List Price}} \dots\dots\dots 80\% \\ \text{Less } 10\% \dots\dots\dots 8\% \\ \hline \text{Net Price} \dots\dots\dots 72\% \end{array}$$

There is 72% left; therefore, 28% has been taken off.

Therefore, 20% and 10% equals a single discount of 28%.

FRACTIONAL METHOD—

$$100 \times \frac{4}{5} \times \frac{9}{10} = 72$$

$$100\% - 72\% = 28\%$$

DECIMAL FRACTION METHOD—

$$100 \times .8 \times .9 = 72$$

$$100\% - 72\% = 28\%$$

1. Find a single discount equal to each of the following series of discounts.

(1) 10% and 10%	(2) 25% and 10%	(3) 40% and 10%	(4) 30% and 10%
(5) 25% and 20%	(6) 10% and 5%	(7) 33⅓% and 10%	(8) 12½% and 5%
(9) 10%, 10% and 5%	(10) 40%, 20% and 5%	(11) 15%, 5% and 5%	(12) 25%, 20% and 15%

PROFIT AND LOSS

Markup is the difference between the cost price and the retail price of merchandise. The term markup is used frequently to refer to the percentage of gain based on the cost price.

EXAMPLE—1: Goods costing \$150 are sold for \$200. Calculate the per cent of markup based on cost.

The markup is $\$200 - \$150 = \$50$.

Per cent of markup is $\frac{50}{150} \times 100 = 33\frac{1}{3}\%$.

2: Goods costing \$150 are marked up 20% of cost. Calculate the selling price.

Markup is 20% of \$150 or \$30.

Selling price is \$150 plus \$30 = \$180.

Or—Selling price is 100% of cost plus 20% of cost = 120% of cost.

Selling price = $\$150 \times 1.2 = \180 .

1. Fill in the blanks. (The markup is based on cost.)

COST PRICE	PER CENT MARKUP	MARKUP	SELLING PRICE	COST PRICE	PER CENT MARKUP	MARKUP	SELLING PRICE
(1) \$15.00	$33\frac{1}{3}$			(11) \$12.50	50		
(2) 21.50	25			(12) 1.30	10		
(3) .48	$12\frac{1}{2}$			(13) .49	20		
(4) 1.25	20			(14) 7.50	$66\frac{2}{3}$		
(5) 6.40	$37\frac{1}{2}$			(15) 24.00	$62\frac{1}{2}$		
(6) 55.00	30			(16) 9.30	$33\frac{1}{3}$		
(7) 120.00	15			(17) 37.50	40		
(8) .36	75			(18) 1.90	50		
(9) 2.19	100			(19) 63.50	35		
(10) 33.50	60			(20) 4.95	40		

2. Fill in the blanks. (The markup is based on cost.)

COST PRICE	SELLING PRICE	GAIN	PER CENT MARKUP	COST PRICE	SELLING PRICE	GAIN	PER CENT MARKUP
(1) \$ 1.50	\$ 2.00			(11) \$25.00	\$27.50		
(2) 8.00	12.00			(12) 4.95	6.50		
(3) 27.00	36.00			(13) 2.45	3.25		
(4) 15.00	25.00			(14) 112.50	150.00		
(5) 2.50	5.00			(15) 99.00	132.00		
(6) 37.50	50.00			(16) 81.50	99.50		
(7) 3.25	9.75			(17) .68	1.02		
(8) 9.75	12.50			(18) 3.30	5.50		
(9) 16.50	24.75			(19) 1.19	1.69		
(10) 3.19	6.38			(20) 145.50	169.50		

PROFIT AND LOSS

The profit or gain on a transaction when expressed in terms of the selling price is referred to as the *margin*.

EXAMPLE—Goods costing \$150 are sold for \$200. Calculate the per cent of margin.

$$\text{Gain} = \$200 - \$150 = \$50.$$

$$\text{Margin} = \frac{50}{200} \times 100 = 25\%.$$

1. Calculate the margin in the following examples.

COST	SELLING PRICE	GAIN	PER CENT MARGIN	COST	SELLING PRICE	GAIN	PER CENT MARGIN
(1) \$.75	\$ 1.00			(6) \$25.00	\$30.00		
(2) 1.25	1.75			(7) 12.50	25.00		
(3) 3.50	4.50			(8) 35.00	42.00		
(4) 9.00	10.00			(9) 120.00	175.00		
(5) 12.50	18.75			(10) 2.85	4.39		

For various reasons, after a selling price has been determined by marking up the cost price of goods, it may be necessary to reduce the price. This is usually done by taking a per cent off the selling price. These reductions are termed *markdowns*. List price then refers to the original selling price.

EXAMPLE—Goods are purchased for \$24, marked up 25 per cent and then marked down 10 per cent. Find the selling price.

$$\text{List Price} = \$24 \text{ plus } \frac{1}{4} \text{ of } \$24 = \$30.$$

$$\text{Markdown} = 10 \text{ per cent of } \$30 = \$3.$$

$$\text{Selling price} = \$30 - \$3 = \$27.$$

2. Complete the following table. (Per cent margin to be calculated on selling price.)

COST PRICE	PER CENT MARKUP	AMOUNT OF MARKUP	LIST PRICE	PER CENT MARKDOWN	AMOUNT OF MARKDOWN	SELLING PRICE	GAIN	PER CENT MARGIN
(1) \$20.00	25			10				
(2) 9.00	$33\frac{1}{3}$			20				
(3) 12.50	40			15				
(4) .90	100			50				
(5) 7.50	60			25				
(6) 3.25	30			10				
(7) 35.00	30			5				
(8) 82.50	50			10 and 10				
(9) 99.75	30			20				
(10) 15.00	$66\frac{2}{3}$			40				

PROFIT AND LOSS

In the problems on the preceding pages, the percentages of profit and discount have been related to known sums of money. In some problems, we know the per cent markup or markdown, but it is not related to any known sum. In solving problems of this type, it is important to remember that if the per cent is based on cost, then cost represents 100 per cent, and the selling price is determined from this base. Correspondingly, if the per cent is based on the selling price, the selling price represents 100 per cent, and the cost is determined from this base.

EXAMPLE 1—Goods sell for \$120, gaining 20% of the cost price. Find the cost price.

The gain in per cent is based on the cost price.

Therefore, let the cost be 100%.

Add the gain of 20% of the cost.

Therefore, the selling price is 120% of the cost.

Selling price = \$120.

Therefore, 120% of cost = \$120.

And the cost is $\frac{120}{120} \times 100 = \100 .

EXAMPLE 2—Goods costing \$80 are sold at a profit of 20% of sales. Find the selling price.

The gain in per cent is based on the selling price.

Therefore, let the selling price be 100%.

Subtract the gain of 20% of the selling price.

Therefore, the cost price is 80% of the selling price.

The cost price = \$80.

Therefore, 80% of the selling price = \$80.

Then the selling price is $\frac{80}{80} \times 100$ or \$100.

1. Show solutions for the following exercises in the spaces provided.

	SELLING PRICE	GAIN ON COST	COST PRICE	(1)	(2)
1	\$30.00	20%			
2	80.00	25%			
3	36.36	33 $\frac{1}{3}$ %			
4	18.20	30%			
5	14.03	15%			
(3)			(4)		(5)

PROBLEMS IN PROFIT AND LOSS

1. Find the selling price in the following problems. Show your solutions in the spaces provided.

COST OF GOODS	DESIRED GAIN ON SELLING PRICE	SELLING PRICE	(1)
(1) \$48.00	20%		
(2) 36.00	40%		
(3) 140.00	30%		
(4) 135.00	15%		
(5) 25.50	50%		
(6) 4.35	37½%		
(7) 9.36	66⅔%		
(2)			(3)
(4)			(5)
(6)			(7)
2. A dealer sold goods for \$32.40, losing 20% of his cost. What was his cost?			3. A dealer sold goods which cost him \$55 at a loss of 10% of his selling price. What was his selling price?

PROBLEMS IN PROFIT AND LOSS

1. Find the cost when a sale of \$13.44 shows a loss of $12\frac{1}{2}\%$ of the cost.

2. Find the selling price when a loss of $12\frac{1}{2}\%$ of the selling price is taken on goods which cost \$24.30.

3. Find the cost when the selling price is \$5.85 and a profit of $8\frac{1}{3}\%$ of cost has been made.

4. Find the selling price when a profit of 25% of the selling price is realized on goods which cost \$6.48.

5. A loss of 25% of sales was taken when goods were sold for \$11.45. What was the cost?

6. Find the selling price of goods which cost \$9.75. A loss of 20% of the cost was taken in this case.

PROBLEMS IN PROFIT AND LOSS

<p>1. What was the cost of goods sold for \$6.72, profit being $16\frac{2}{3}\%$ of sales?</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>2. Goods which cost \$10.32 were sold at a profit of \$3.87. What was the profit per cent in on cost?</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>3. A profit of 30% of sales realized \$4.85. Find the amount of sales.</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>4. A loss of 30% of sales amounted to \$15.75. What was the cost of the goods sold?</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

5. Fill in the blank spaces in the following table.

No.	COST	PER CENT PROFIT OR LOSS	AMOUNT OF PROFIT OR LOSS	SELLING PRICE
1	\$ 8.28	$33\frac{1}{3}\%$ gain on cost		
2	19.50	20% loss on cost		
3		$8\frac{1}{3}\%$ profit on cost		\$11.70
4		$12\frac{1}{2}\%$ loss on cost		26.88
5	12.96	25% profit on the selling price		
6	48.60	$12\frac{1}{2}\%$ loss on the selling price		
7	20.64	. . . % profit on cost	\$ 3.87	
8		20% profit on the selling price	\$15.75	

PROBLEMS IN PROFIT AND LOSS

1. At what price should a dealer list a pen, which cost \$4.40, in order that he may allow a 10% discount and still gain 25% of his cost?

2. A dealer buys an article to be sold for \$16.60. At what price must it be bought if he is to gain $33\frac{1}{3}\%$ of cost?

3. A dealer buys goods for \$27. At what price must he list them so that he may gain 25% of his selling price after allowing a discount of 10%?

4. A dealer purchases television sets for \$210 each. He lists them at the suggested retail price of \$329.50. If he allows a 10% discount for cash, what is:
 (a) His selling price?
 (b) His gain per cent on cost?
 (c) His gain per cent on selling price?

5. Goods which cost \$48.60 are sold at a loss of $12\frac{1}{2}\%$ of the selling price. What is the selling price?

6. Goods are sold at a loss of 25% of the selling price, the loss being \$14.40. What was the cost of the goods sold?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Add.

(1) 3456.89	(2) 2345.89	(3) 19876.45	(4) 23456.87
7863.98	7887.67	81091.87	34561.09
7887.34	3434.32	19191.34	45671.00
3456.67	7878.35	19456.30	45656.98
9814.54	1435.34	45670.15	17156.15
7815.08	4536.87	34571.11	89171.51
3333.35	8717.45	30211.08	18199.49
4545.45	8787.85	87999.95	34576.43
3455.43	4356.43	43432.22	23234.55
<u>8778.88</u>	<u>3344.55</u>	<u>13133.45</u>	<u>45090.09</u>

2. Subtract.

(1) 78989.45	(2) 3457845.45	(3) 3434589.18	(4) 3456789.98
<u>65781.54</u>	<u>1993454.56</u>	<u>1143783.14</u>	<u>1234578.99</u>

3. Multiply.

(1) 34587.76	(2) 345678.34	(3) 4567.87	(4) 3457680.18
<u>9</u>	<u>7</u>	<u>35</u>	<u>16.47</u>

4. Divide.

(1) 7) 456456644	(2) 9) 13583786598	(3) 345) 4765893	(4) 1.78) 34.189
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5. Calculate.

(1)	(2)
144 × 50¢ =	14 × 99¢ =
172 × 25¢ =	55 × 1.01 =
64 × 75¢ =	32 × 1.02 =
160 × 37½¢ =	144 × 8⅓¢ =
48 × 16⅔¢ =	98 × 35¢ =
Total	Total
=====	=====

UNIT 5

ADDITIONAL APPLICATIONS OF PERCENTAGE

COMMISSION

Commission is the term used to describe the charge made by brokers and agents of various types for their services in buying or selling for others. This commission is usually charged as a percentage of the amount involved.

EXAMPLE 1—A real estate agent sells a house for \$5,800, charging a $3\frac{1}{2}\%$ commission. Calculate the agent's commission and the proceeds.

Commission rate is $3\frac{1}{2}\%$ or .035.
 Amount of commission is $\$5,800 \times .035 = \203 .
 Proceeds = $\$5,800 - 203 = \$5,597$.

EXAMPLE 2—A grain broker purchased 2,000 bushels of barley for a client at \$1.13, charging 3% commission. Calculate the commission and the total cost.

Cost of the barley = $2,000 \times \$1.13 = \$2,260.00$
 Commission = $.03 \times \$2,260 = \underline{67.80}$
 Total Cost = $\$2,327.80$

1. Calculate the commission and the proceeds.

GOODS SOLD	RATE OF COMMISSION	COMMISSION	PROCEEDS
(1) \$15,200.00	$3\frac{1}{2}\%$		
(2) 3,150.00	5%		
(3) 950.85	$5\frac{1}{2}\%$		
(4) 4,975.50	$4\frac{1}{2}\%$		
(5) 1,124.15	$2\frac{1}{2}\%$		

2. Calculate the commission and the total cost.

GOODS BOUGHT	RATE OF COMMISSION	COMMISSION	TOTAL COST
(1) \$49,315.00	$3\frac{3}{4}\%$		
(2) 1,834.95	$4\frac{1}{2}\%$		
(3) 4,324.00	3%		
(4) 1,198.75	$1\frac{1}{2}\%$		
(5) 3,345.10	$3\frac{1}{4}\%$		

3. An agent purchased for his client 6,000 bushels of wheat at \$1.87. He paid \$43.50 storage charges and \$137.67 in freight charges. What was the total cost for his client if his commission rate was $3\frac{1}{2}\%$?

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4. An agent sold for his client 500 bu. of peas at \$2.75, and 750 bu. of beans at \$2.81. He charged 4% commission. How much should he remit to his client?

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COMMISSION ON GOODS SOLD—ACCOUNT SALES

When an agent disposes of merchandise for his client, he deducts his commission and remits the proceeds to his client. To explain how the proceeds were calculated, he sends an *Account Sales* with the remittance. The illustration below shows the form of the account sales.

ACCOUNT SALES					No. 1167
LOWE WHOLESALERS					
General Merchandise Dealers					
Windsor, Ontario					
					August 1, 19—
Account of Sales for: Mr. J. H. Farmer					
Essex, Ontario					
July 27	5000	6 qt. baskets	No. 1 Peaches	.60	\$3,000.00
	2000	" " "	No. 2 "	.50	1,000.00
Gross Proceeds					4,000.00
<u>Charges</u>					
	Storage			\$ 25.00	
	Commission—5%			200.00	225.00
Net Proceeds					<u>\$3,775.00</u>

1. Complete the Account Sales for the following transactions on the forms provided on the next page.

(1) November 2. Sold for M. Kennedy, Cottam, Ontario.

1,000 bu. apples at \$1.65; 500 bu. pears at \$2.10
Charges: Freight, \$37.50; Commission, 5%.

(2) January 3. Sold for B. Bolton, Kingsville, Ontario.

400 turkeys, total weight—5760 pounds at 34¢ per lb.
300 turkeys, total weight—3675 " " 31¢ " "
Charges: Trucking, \$32.75; Feed and Storage, \$41.25;
Commission, 6%.

(3) November 15. Sold for Southland Farms, Leamington, Ontario.

750 6 qt. baskets grapes at 60¢ per basket
150 " " " " 55¢ " "
300 11 qt. " " " 98¢ " "
Freight, \$47.85; Storage, \$11.50; Commission, 7%.

ACCOUNT SALES
LOWE WHOLESALERS
General Merchandise Dealers
Windsor, Ontario

No.

Account of Sales for.....

Date.....

ACCOUNT SALES
LOWE WHOLESALERS
General Merchandise Dealers
Windsor, Ontario

No.

Account of Sales for.....

Date.....

ACCOUNT SALES
LOWE WHOLESALERS
General Merchandise Dealers
Windsor, Ontario

No.

Account of Sales for.....

Date.....

COMMISSION ON GOODS PURCHASED—ACCOUNT PURCHASE

Agents who buy merchandise for their clients, submit an *Account Purchase*, which shows the amount paid for the goods, known as the *prime cost*, and the charges for freight, insurance, storage, commission, etc. The charges are added to the prime cost to show the *gross cost*, which is the amount to be paid by the client. The illustration below shows the form of the Account Purchase.

ACCOUNT PURCHASE			
MEDFORD MERCHANDISE AGENTS			No. 878
Medford Park Lane			
Toronto, Ontario			
Purchased for account of: Lowe and Company			Date: Oct. 31, 19—
Windsor, Ontario			
October 17	2000 doz. Glass Buttons at	.38	\$760.00
	2000 " Plastic " "	.23	460.00
			<u>1,220.00</u>
	<u>Charges</u>		
	Express	\$17.10	
	Insurance	2.15	
	Commission—4% on \$1,220.00	48.80	
			<u>68.05</u>
			<u><u>\$1,288.05</u></u>

1. Complete Account Purchases for the following transactions on the forms provided on the next page. Date them as of the last day of the month.

1. January 7. Purchased for Mr. M. N. Rawlings, Toronto, Ontario.

1,000 bu. Barley at \$1.25
 2,000 " Feed oats " .68½
 Charges: Freight, \$39.45; Commission 3%.

2. February 1. Purchased for K. L. Lawrence and Sons, London, Ontario.

5,000 bu. Yellow Corn at \$1.54
 2,000 " Ont. Flax " 2.93
 Charges: Freight, \$68.10; Insurance, \$11.45; Commission, 3½%.

3. March 23. Purchased for Bailey Brothers, Ltd., Windsor, Ontario.

1,000 doz. Grade A Large Eggs at .48 a doz.
 2,000 " " A Med. Eggs " .41 " "
 1,500 " " B Eggs " .37 " "
 Charges: Express, \$57.18; Insurance, \$2.48; Storage, \$18.40; Commission 5%.

ACCOUNT PURCHASE

MEDFORD MERCHANDISE AGENTS

Medford Park Lane

Toronto, Ontario

No.....

Purchased for account of.....

Date.....

ACCOUNT PURCHASE

MEDFORD MERCHANDISE AGENTS

Medford Park Lane

Toronto, Ontario

No.....

Purchased for account of.....

Date.....

ACCOUNT PURCHASE

MEDFORD MERCHANDISE AGENTS

Medford Park Lane

Toronto, Ontario

No.....

Purchased for account of.....

Date.....

FIRE INSURANCE

Insurance is the term given to protection from loss through some unfortunate occurrence. *Fire Insurance* is protection against loss of property through fire. The agreement with the insurance company is called the *policy*. The insurance company is called the *insurer*, and the owner of the property insured is called the *insured*. The amount paid to the insurance company is called the *premium*, and the amount of protection is called the *face* of the policy.

In this unit, we shall consider fire insurance on business and residential property.

The rates charged by the insurance companies vary according to the type of construction of the building and the fire protection service in the community.

The premium rates quoted by insurance companies for residential property are for \$100 of insurance for a period of 3 years.

EXAMPLE 1—A house is insured for \$6,000 at a rate of 37 cents per \$100 for 3 years. Find the premium.

$$\text{Divide by 100 and multiply by 37¢} — \frac{\$6000}{100} \times .37 = \$22.20.$$

The premium rates quoted by insurance companies for commercial properties are for \$100 of insurance for a period of one year. Usually, the rate is reduced if the insurance is taken out for a period of three years. The reduction at the present time is determined by calculating the premium for 3 years and then deducting 10 per cent.

EXAMPLE 2—A warehouse is insured for 3 years for \$9,000, the annual premium being 67 cents per \$100. Find the amount of the premium.

$$\text{Premium for 3 years} = \frac{\$9,000}{100} \times \$.67 \times 3 = \$180.90$$

$$\text{Deduct 10 per cent} \dots\dots\dots \underline{18.09}$$

$$\text{Amount of premium} \dots\dots\dots \$162.81$$

1. Find the premium in each of the following exercises.

(1) A house insured for \$7,500 at a rate of 49 cents.	(2) A business block insured for \$23,500 at a rate of 34 cents.	(3) A business property insured for \$8,000 for 3 years at a rate of 46 cents.

2. Find the premium in each of the following policies. (Observe the 3-year business policies.)

No.	FACE OF POLICY	TYPE OF PROPERTY	RATE	PREMIUM		No.	FACE OF POLICY	TYPE OF PROPERTY	RATE	PREMIUM	
1	\$7,800.00	Residential	\$.49			6	\$10,000	Residential	\$.55		
2	5,500.00	Business	.39			7	15,000	Bus., 3 yrs.	.44		
3	25,000.00	Bus., 3 yrs.	.41½			8	12,500	Residential	.57		
4	17,500.00	Business	.39			9	110,000	Bus., 3 yrs.	.33		
5	4,400.00	Residential	.67			10	55,000	Business	.34½		

FIRE INSURANCE

If fire insurance is taken out for periods of less than one year on commercial properties, or for less than three years on residential property, the premium is determined by the use of a table of short-term rates. These rates are based on percentages of the regular rates. The tables of percentages are given below.

SHORT-TERM TABLE
Based on Annual Rates

SHORT-TERM TABLE
Based on Three-Year Rates

TIME IN DAYS	PERCENTAGE TO BE CHARGED OR RETAINED	TIME IN DAYS	PERCENTAGE TO BE CHARGED OR RETAINED	TIME IN MONTHS	PERCENTAGE TO BE CHARGED OR RETAINED	TIME IN MONTHS	PERCENTAGE TO BE CHARGED OR RETAINED
1	5	80	31	12	37	24	69
2	6	85	34	13	40	25	71
3 or 4	7	90 (3 mo.)	35	14	42	26	74
5 or 6	8	105	39	15	45	27	76
7 or 8	9	120 (4 mo.)	43	16	47	28	79
9 or 10	10	135	47	17	50	29	82
11 or 12	11	150 (5 mo.)	52	18	53	30	84
13 or 14	12	165	56	19	55	31	87
15 or 16	13	180 (6 mo.)	60	20	58	32	90
17 or 18	14	195	63	21	61	33	92
19 or 20	15	210 (7 mo.)	67	22	63	34	95
25	17	225	70	23	66	35	97
30 (1 mo.)	19	240 (8 mo.)	73			36	100
35	20	255	76	NOTE: For 3-year policies in force for less than one year, take 37% of the 3-year premium and use the table for annual policies.			
40	21	270 (9 mo.)	80				
45	23	285	83				
50	24	300 (10 mo.)	86				
55	26	315	90				
60 (2 mo.)	27	330 (11 mo.)	93				
65	28	345	96				
70	30	360	99				
75	31	365 (12 mo.)	100				

1. Using the tables of short-term rates shown above, calculate the short-term premiums.

EXAMPLE 1—During transfer of ownership, a business man wishes to insure a building for 2 months for \$10,000. If the yearly rate per \$100 is 50 cents, find the premium.

$$\text{Annual premium} = \frac{10,000}{100} \times .50 = \$50.00.$$

Reading from the Short-Term Table based on Annual Rates, we find that the percentage of the annual premium to be charged for 60 days, or 2 months, is 27.

Therefore, the premium is $\$50 \times .27 = \13.50 .

EXAMPLE 2—A man wishes to insure his house for \$5,000 for one year. If the rate is 51 cents per \$100 for 3 years, find the amount of the premium.

$$\text{Premium for the 3-year period} = \frac{\$5000}{100} \times .51 = \$25.50.$$

Reading from the Short-Term Table Based on Three-Year Rates, we find that the percentage of the 3-year premium to be charged for 12 months is 37.

Therefore, the premium for 1 year = $\$25.50 \times .37 = \9.44 .

FIRE INSURANCE

1. Using the short-term tables, calculate the premiums in the following policies.

(1) \$5,500 insurance on a warehouse for thirty days. The annual rate is 42 cents.

(2) \$18,000 insurance on a store building for five months. The annual rate is 28 cents.

(3) \$7,000 insurance on a house for two years.
The 3-year rate is 54 cents.

(4) \$9,500 insurance on a garage building for ten days. The annual rate is 41 cents.

(5) \$2,500 insurance on a house for fifteen months. The 3-year rate is 53 cents.

(6) \$15,000 insurance on a store building for 5 days. The annual rate is 30 cents.

(7) \$5,000 insurance on a house for sixty days. The 3-year rate is 51 cents.

(8) \$11,500 insurance on a house for ten months. The 3-year rate is 49 cents.

FIRE INSURANCE—CANCELLATIONS AND REFUNDS

Insurance may be cancelled before the full term expires, in which case a refund is made to the insured. If the policy is cancelled by the insuring company, the refund is the proportion of the premium that the unexpired period is of the full period.

EXAMPLE 1—A house is insured for \$4,000 for a 3-year period, the premium amounting to \$24. The company cancels the policy at the end of 27 months. How much of the premium should be refunded?

The unexpired period is 36 months — 27 months = 9 months.

Therefore, the refund should be $\frac{9}{36} \times \$24 = \6.00 .

If the insurance is cancelled by the policy holder, the company does not refund on a pro rata basis, but according to the short-term tables.

EXAMPLE 2—A house is insured for \$4,000 for a 3-year period, the premium amounting to \$24. The insurance is cancelled by the owner at the end of 27 months. How much of the premium should be refunded?

The percentage of the 3-year period to be charged for a period of 27 months, according to the Short-Term Table, is 76.

The refund would then be $100\% - 76\% = 24\%$.

24% of \$24 = $24 \times .24 = \$5.76$.

NOTE: If in using the short-term tables, the exact time is not shown, use the next (higher) category.

1. Calculate the refund on the following policies.

<p>(1) A factory building was insured for \$18,000 at an annual rate of 34¢. The owner cancelled the policy 8 months later.</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>(2) A \$5,000 policy at a rate of 45¢ for 3 years was cancelled by the owner after 30 days. (See the note at the foot of the table.)</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>(3) A \$10,000 policy at an annual rate of 37¢ was cancelled after 40 days by the insured.</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>(4) An \$8,500 policy at rate of 56¢ for 3 years was cancelled by the insurer at the end of 31 months.</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>(5) A \$9,000 policy at 3-year rate of 58¢ was cancelled by the insured at the end of 18 months.</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>(6) A \$2,500 policy at annual rate of 32¢ was cancelled by the insurer at the end of 300 days.</p> <p>.....</p> <p>.....</p> <p>.....</p>

FIRE INSURANCE—RISKS SHARED BY SEVERAL COMPANIES

If property is protected against loss by fire by insuring it with more than one company, any loss that occurs must be paid by each company in proportion to the amount of the total risk it carries.

EXAMPLE—A building is insured with Company A for \$5,000, Company B for \$8,000, and Company C for \$7,000. There is a loss through fire amounting to \$4,000. How much must each company pay?

Company A has \$5,000

" B " 8,000

" C " 7,000

Total Insurance \$20,000

Company A will pay $\frac{5,000}{20,000} \times \$4,000 = \$1,000.00$

" B " " $\frac{8,000}{20,000} \times \$4,000 = \$1,600.00$

" C " " $\frac{7,000}{20,000} \times \$4,000 = \$1,400.00$
\$4,000.00

1. Show your solutions to the following problems?

(1) A building was insured for \$3,500 in one company and for \$7,000 in another. A fire caused \$720 damage. How much did each company pay?

(3) A garage is insured with three different companies as follows: Ajax, \$6,500; Essex, \$4,500; Mutual, \$4,000. What proportion of a loss of \$4,500 must each pay?

(5) A school is insured with three companies as follows: Kent, \$150,000; Norton, \$100,000; Belmont, \$250,000. How much must each pay if fire causes \$19,500 damage?

(2) A store is insured with Company A for \$3,000, Company B for \$2,000, and Company C for \$1,000. If there is a loss of \$5,400, how much should each company pay?

(4) A firm insures its buildings with three companies—Royal, \$7,000; Standard, \$10,000; Norfolk, \$12,000. What share must each pay of a loss of \$5,000?

(6) A hotel is insured with 4 companies—A, \$9,000; B, \$6,000, C, \$7,000; D, \$8,000. How much must each pay of a \$23,000 loss?

LIFE INSURANCE

The basic purpose of life insurance is to protect dependents from complete loss of income in case of the death of the insured. There are several types of insurance:

- (a) **TERM INSURANCE**, which provides cheap insurance for a definite period of time.
- (b) **ORDINARY LIFE INSURANCE**, for which premiums are paid during one's life time, but on which credits may accumulate (dividends and extended insurance).
- (c) **LIMITED PAYMENT LIFE INSURANCE**, which provides that the insured pays premiums only for a specified time, when the insurance is paid up.
- (d) **ENDOWMENT INSURANCE**, which provides payment in event of death, but also payment to the insured if he is still living at the end of a specified period.

There are many other types of insurance and special provisions such as family income, double indemnity in case of accidental death, waiver of premium in event of illness, etc.

Premiums for life insurance are usually quoted on the basis of \$1,000 for one year. The rates vary according to age, and monthly, quarterly, or semi-annual premiums run a little higher than the annual premium rate.

The following is a partial table of Life Insurance Rates.

LIFE INSURANCE
Annual Premiums per \$1,000.00

AGE	20 YEAR TERM NON-PARTICIPATING	TERM TO 65 NON-PARTICIPATING	ORDINARY LIFE ENDOWMENT AT 85	10-PAY LIFE	20 PAY LIFE	ENDOWMENT IN 20 YEARS
15			\$15.49	\$43.97	\$25.45	\$47.80
16			15.83	44.69	25.87	47.88
17			16.19	45.44	26.32	47.97
18			\$16.56	\$46.18	\$26.77	\$48.04
19			16.92	46.93	27.20	48.10
20	\$ 6.95	\$10.05	17.31	47.69	27.65	48.18
25	\$ 7.55	\$10.90	\$19.47	\$51.64	\$30.04	\$48.47
30	\$ 8.55	\$12.10	\$22.19	\$56.18	\$32.85	\$48.98
35	\$10.35	\$13.70	\$25.81	\$61.65	\$36.35	\$49.98
40	\$13.50	\$15.75	\$30.53	\$68.05	\$40.66	\$51.70
45	\$18.65	\$18.65	\$36.76	\$75.48	\$46.01	\$54.44
50	\$27.50	\$22.60	\$45.06	\$84.16	\$52.87	\$58.83

1. Find the premium in each of the following using the above table.

No.	AGE	AMOUNT OF INSURANCE	TYPE OF INSURANCE	PREMIUM		No.	AGE	AMOUNT OF INSURANCE	TYPE OF INSURANCE	PREMIUM	
1	20	\$2,000.00	20-Year Term			6	35	\$10,000.00	Ordinary Life		
2	40	8,000.00	10-Pay Life			7	15	3,000.00	End'm't in 20		
3	45	5,000.00	Term to 65			8	20	2,000.00	10-Pay Life		
4	25	6,000.00	20-Pay Life			9	18	2,500.00	End'm't in 20		
5	30	4,000.00	Ordinary Life			10	35	7,500.00	20-Year Term		

LIFE INSURANCE

In determining the premium for various types of life insurance, the cost, which increases each year, is frequently spread evenly over the years. This means that the premiums during the early years are larger than the actual cost of the insurance. The policy holder builds up a reserve upon which he may earn dividends, withdraw completely, use as security for a loan, or use to buy paid-up or extended insurance. The following table is taken from a typical policy.

TABLE OF GUARANTEED VALUES PER \$1,000 OF ASSURANCE

If the Principal Sum Assured is greater or less than \$1,000, the Cash and Paid-up Values will be increased or decreased proportionately, but the periods of Extended-Term Assurance remain unchanged. Loan Values are 94% of the Corresponding Cash Values.

END OF POLICY YEAR	CASH VALUE	PAID-UP INSURANCE	EXTENDED-TERM INSURANCE		END OF POLICY YEAR	CASH VALUE	PAID-UP INSURANCE	EXTENDED-TERM INSURANCE	
			YEARS	MONTHS				YEARS	MONTHS
2	\$ 0	\$ 0	0	0	11	\$119	\$354	13	11
3	10	37	1	5	12	136	383	15	3
4	22	81	3	2	13	154	413	16	5
5	34	122	4	9	14	172	441	17	5
6	46	161	6	3	15	191	468	18	4
7	60	206	8	0	16	209	496	19	0
8	74	249	9	9	17	228	522	19	7
9	88	289	11	2	18	247	549	20	2
10	103	324	12	7	19	267	572	20	8
					20	292	599	21	4

From this table, the policyholder can determine what values are available to him from his policy.

EXAMPLE—What values can be secured for a \$2,000 policy which has been in force for 7 years?

The cash value per \$1,000 at the end of the 7th policy year is \$60.

Therefore, the policy has a cash value of $2 \times \$60 = \120 .

The loan value is 94% of this = $.94 \times \$120 = \112.80 .

The paid-up insurance is \$206 per \$1,000, and on \$2,000 it is \$412.

The Extended-Term Insurance would remain in force for 8 years.

1. From the table, calculate the Cash Value and the Loan Value.

No.	FACE	POLICY YEAR	CASH VALUE	LOAN VALUE	No.	FACE	POLICY YEAR	CASH VALUE	LOAN VALUE
1	\$3,000.00	7 years			6	\$8,500.00	11 years		
2	7,500.00	13 "			7	500.00	17 "		
3	5,000.00	6 "			8	1,500.00	16 "		
4	2,500.00	18 "			9	4,000.00	20 "		
5	8,000.00	19 "			10	3,500.00	9 "		

2. A policy holder decides at the end of the 7th year to stop paying premiums and take the value of his policy in extended-term insurance. What is the cost per \$1,000 per year based on the above table?

3. A policy holder paid \$23.50 per \$1,000 for 10 years, and then cashed in his policy. Considering the refund, what was the actual cost per year per \$1,000 based on the above table?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Complete the following weekly report of insurance sales.

ROYAL CANADIAN INSURANCE COMPANY District Sales Report—Week of October 17—22, 19..							
DISTRICT	MON.	TUES.	WED.	THURS.	FRI.	SAT.	TOTALS
Maritimes	\$118,000	\$224,000	\$117,500	\$432,450	\$ 99,340	\$215,320	
Quebec—Eastern	146,567	234,876	345,000	345,340	435,545	345,500	
Quebec—Western	345,456	234,587	234,500	345,764	567,765	234,564	
Ontario—East	456,345	564,345	234,568	324,567	785,675	456,765	
Ontario—West	456,345	678,650	567,450	457,785	875,450	345,675	
Manitoba	134,540	98,765	99,875	132,325	119,995	95,455	
Saskatchewan	74,135	67,450	56,756	98,456	78,765	45,455	
Alberta	134,456	123,430	115,555	134,456	187,567	134,555	
British Columbia	145,456	345,567	435,565	546,765	345,675	456,785	
Territorial Office	17,345	13,134	9,965	11,565	12,345	23,235	
Totals							

2. Calculate the amount of the following invoices of yard goods.

(1) 12 pieces of gold brocade consisting of: 23, $24\frac{1}{2}$, 21, $21\frac{3}{4}$, 24, $20\frac{1}{4}$, $19\frac{3}{4}$, $24\frac{1}{2}$, 24, $23\frac{1}{2}$, 24, $21\frac{1}{2}$, yards, at \$4.56 a yard		(2) 10 pieces of nylon damask consisting of: $31\frac{1}{2}$, $34\frac{1}{4}$, $23\frac{1}{2}$, 35, $35\frac{1}{2}$, 36, $35\frac{1}{4}$, 34, $36\frac{1}{2}$, $33\frac{3}{4}$, yards, at \$5.15 a yard	
Less 10%		Less 15%	

3. Using equivalent fractions, calculate the following percentages.

(1) 10% of 371 =	(2) 25% of 436 =	(3) $37\frac{1}{2}\%$ of 24 =	(4) 30% of 111 =
20% of 255 =	40% of 211 =	$87\frac{1}{2}\%$ of 32 =	90% of 90 =
75% of 244 =	5% of 120 =	$6\frac{1}{4}\%$ of 48 =	$8\frac{2}{3}\%$ of 84 =
$83\frac{1}{3}\%$ of 36 =	125% of 44 =	$18\frac{3}{4}\%$ of 32 =	$9\frac{1}{11}\%$ of 55 =
$11\frac{1}{8}\%$ of 54 =	$66\frac{2}{3}\%$ of 33 =	$62\frac{1}{2}\%$ of 40 =	40% of 60 =

4. Using equivalent decimal fractions, calculate the following percentages.

(1) 22% of 5 =	(2) 41% of 10 =	(3) 37% of 7 =	(4) 45% of 9 =
31% of 6 =	33% of 12 =	41% of 11 =	87% of 3 =
101% of 23 =	99% of 9 =	56% of 11 =	21% of 7 =
108% of 9 =	13% of 12 =	12% of 34 =	102% of 8 =
23% of 7 =	51% of 10 =	85% of 11 =	103% of 9 =
19% of 6 =	45% of 12 =	14% of 5 =	17% of 3 =

UNIT 6

MUNICIPAL TAXES

CALCULATING THE TAX AND THE RATE

Municipal taxes are levied on the assessed value of the property of the community. The tax rate is stated as so many *mills on the dollar* of assessment—the mill being $\frac{1}{10}$ of a cent.

EXAMPLE—The assessment on a property is \$5,000. The tax rate is 51 mills. Find the taxes.

A mill is $\frac{1}{10}$ of a cent, and 1 cent is $\frac{1}{100}$ of a dollar.

Therefore, 1 mill is $\frac{1}{1000}$ of a dollar ($\frac{1}{10}$ of $\frac{1}{100}$).

And, 51 mills is $\frac{51}{1000}$ of a dollar.

Therefore, the tax is $\$5,000 \times .051 = \255.00 .

NOTE—To calculate the tax, we multiply the assessment by the rate divided by 1,000.

- Find the tax on each of the following assessments.

No.	ASSESSMENT	TAX RATE	AMOUNT OF TAX	No.	ASSESSMENT	TAX RATE	AMOUNT OF TAX
1	\$2,000.00	41 mills		6	\$7,300.00	56 mills	
2	4,500.00	43½ "		7	4,250.00	52 "	
3	7,740.00	36 "		8	9,400.00	49½ "	
4	3,300.00	58 "		9	3,950.00	38 "	
5	6,200.00	61 "		10	12,500.00	53 "	

To determine the tax rate, a municipality requires each of the tax spending bodies to present a budget of anticipated expenditures for the coming year. From the total of these budgets, the amount of money that must be raised by taxation is determined. When this is known, the municipality can then set the mill rate for the current year.

EXAMPLE—A municipality with a total assessment of \$1,750,000 requires \$87,500 to meet its expenditures for the current year. What should the mill rate be?

1 mill is $\frac{1}{1000}$ of a dollar.

Therefore, 1 mill of tax on \$1,750,000 is $\frac{1,750,000}{1,000} = \$1,750$.

Number of mills required to raise \$87,500 = $\frac{87,500}{1,750} = 50$.

Therefore, the tax rate is 50 mills.

NOTE—To find the tax rate in mills, divide the amount required by the total assessment and multiply by 1,000.

- Find the rate on each of the following assessments, correct to 1 decimal place.

No.	TOTAL ASSESSMENT	AMOUNT REQUIRED	RATE	No.	TOTAL ASSESSMENT	AMOUNT REQUIRED	RATE
1	\$ 4,500,000	\$ 166,500		6	\$ 37,000,000	\$1,091,500	
2	3,100,000	148,800		7	1,600,000	77,200	
3	19,500,000	780,000		8	4,250,800	178,500	
4	168,500,000	8,593,500		9	1,360,000	45,000	
5	92,340,000	3,739,700		10	47,280,000	1,300,000	

PROBLEMS IN MUNICIPAL TAXES

1. J. Lee owns three houses which are assessed at \$3,700, \$2,900, and \$4,150. He rents them for \$45, \$50, and \$65 a month, respectively. If the tax rate is 42 mills, what per cent of his rental income is paid out in tax?

2. B. Kennedy owns a house which is assessed for \$4,300. He pays \$120 interest on his mortgage, \$15 for insurance, and \$200 for repairs and upkeep. If the tax rate is 51 mills, what does it cost him to live in the house for a year?

3. By special arrangement, the taxes on a project house are fixed at \$40 a year. If the house ordinarily would be assessed for \$3,000, and the tax rate is 54 mills, how much does the city lose by this arrangement in the current year?

4. The assessment on a house in one city is \$4,000, and the tax rate is 54 mills. On a similar house in another city, the assessment is \$5,000, and the mill rate is 49. Which has the higher tax? By how much?

5. The taxes in a municipality are made up as follows: Education, $16\frac{1}{2}$ mills; Public Works, 23 mills; Fire Protection, $4\frac{1}{2}$ mills; Police Protection, 5 mills; Other items, 6 mills. On a house which is assessed for \$4,400, how much is paid for each?

6. On a street requiring new sidewalks, the total assessment of property is \$172,000. If the sidewalks would cost \$7,500, what mill rate (correct to 1 decimal point) should be levied to pay for this local improvement over a period of 10 years?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

When adding a very long column of figures, it is better to break it down into sub-totals. Add the following columns of figures.

1. 2345789 4576311 4567468 5678901 8787187 5643561 6754321 5489015 9056783 8976868 7657861 5647581 7587544 3457899 5618901 4387594 4831455 7644443 7858945 6543895 6578432 7651984 7894515 3458766 7897859 7845555 8756413 8745867 3451877 9878787	2. 3434328 8787654 1091784 1098109 1819191 8718765 1213147 4357614 3423456 4536477 1910455 4318991 9104563 1094563 3413133 4890875 7845679 3438907 2314045 6758908 4690875 4589877 4390877 4565654 3458766 3444884 3458904 1324567 3458909 3467577	3. 5676541 3467589 4517890 9081811 7678919 3423234 7656909 1897685 8756488 6790198 1897581 3247845 3210755 8756111 3244541 8756774 3490087 4598766 3498088 3487994 3487691 3487589 3789018 4430089 1875675 8750999 4508757 5690898 9897654 3344338	4. 8765431 8765323 8790987 1864356 1086355 6543781 7890909 7342221 7565677 4560911 3476815 4590899 4378101 1345555 5489099 4398088 7676767 7897564 1565554 3489653 3289755 1389055 1876555 1957656 9087643 3232221 3458758 4358019 9043877 8777654
5. 7654831 7834567 4311344 5656665 8745891 1341345 4343435 3344556 7876545 1456788 1897654 1894657 1931931 2249224 1913456 1345687 1931345 1319084 3451341 3451913	6. 3457859 3467811 3448877 1113441 1345678 1341345 5454654 5555774 3455110 8787766 3457899 1199009 1365191 2344134 1347819 1309345 1987301 1234584 2345671 1345444	7. 3458984 3457811 7878455 2345673 1987644 1989898 7887878 3432341 1010101 3456789 1987654 1897455 1903456 4323451 1010909 3535534 1345141 1934567 3131313 1324566	8. 3456781 1199889 3434444 3458100 1341343 3434345 3418933 1010108 3410345 9876543 3444333 7654338 7413934 1345134 1910983 3413289 1320990 1923458 9090349 4334434

UNIT 7

SIMPLE INTEREST

CALCULATING INTEREST

Interest is the term given to the amount paid for the use of money. The amount used or borrowed is called the *principal*. Interest is usually charged as a per cent of the principal for one year. Most problems related to interest involve finding the interest on a loan.

EXAMPLE—Find the interest on a loan of \$300 for 73 days at 5% per annum.

$$\begin{aligned}\text{Interest} &= \frac{5}{100} \text{ of } \$300 \text{ for } \frac{73}{365} \text{ of a year.} \\ &= .05 \times 300 \times \frac{1}{5} = \$3.00.\end{aligned}$$

Note that interest can be determined by multiplying Principal \times Rate \times Time. Time is in years. This formula for finding interest is usually expressed as $I = PRT$.

1. Find the interest on the following loans. Show your solutions in the spaces provided.

No.	PRINCIPAL	RATE	TIME	INTEREST	No.	PRINCIPAL	RATE	TIME	INTEREST
1	\$ 100.00	5%	3 years		6	\$ 350.00	4%	120 days	
2	500.00	6%	6 "		7	750.00	5%	93 "	
3	400.00	4½%	2 "		8	1,000.00	5½%	183 "	
4	250.00	7%	146 days		9	615.00	6%	53 "	
5	1,000.00	6½%	219 "		10	325.00	7%	33 "	
(1)					(2)				
(3)					(4)				
(5)					(6)				
(7)					(8)				
(9)					(10)				

CALCULATING THE PRINCIPAL, TIME AND RATE

Some problems arise where it is necessary to find the principal.

EXAMPLE—If a man can invest money in bonds at 3 per cent per annum, what sum must he invest to pay him \$600 interest at the end of 5 years?

Use the formula $I = PRT$.

$$\$600 = P \times .03 \times 5$$

$$\text{Or } .15P = 600$$

$$\text{Therefore, } P = \frac{600}{.15} = \frac{60,000}{15} = \$4,000.$$

$$\text{PROOF: } \$4,000 \times .03 \times 5 = \$600.$$

1. Find the principal in each of the following cases.

No.	INTEREST REQUIRED	TIME	RATE	PRINCIPAL	No.	INTEREST REQUIRED	TIME	RATE	PRINCIPAL
(1)	\$720.00	4 yrs.	6%		(3)	\$896.00	8 yrs.	7%	
(2)	247.50	3 yrs.	5½%		(4)	306.00	2 yrs.	3%	

It is sometimes necessary to find the time.

EXAMPLE—How long will it take \$3,000 to earn \$450 interest at 3% per annum?

Use the formula $I = PRT$.

$$\$450 = \$3,000 \times .03 \times T.$$

$$\text{Or } 90T = 450.$$

$$\text{Therefore, } T = \frac{450}{90} = 5 \text{ years.}$$

$$\text{PROOF: } \$3,000 \times .03 \times 5 = \$450.$$

2. Find the time.

No.	INTEREST REQUIRED	PRINCIPAL	RATE	TIME	No.	INTEREST REQUIRED	PRINCIPAL	RATE	TIME
(1)	\$1,260.00	\$3,000.00	6%		(3)	\$210.00	\$7,000.00	6%	
(2)	369.00	4,100.00	3%		(4)	405.00	2,700.00	4%	

In some cases, it is necessary to find the rate.

EXAMPLE—What rate of interest per annum must be secured on \$5,000 to earn \$600 in 3 years time?

Use the formula $I = PRT$.

$$\$600 = \$5000 \times R \times 3.$$

$$\text{Or } 15,000R = \$600.$$

$$\text{Therefore, } R = \frac{600}{15000} = .04 \text{ or } 4\%.$$

$$\text{PROOF: } \$5,000 \times .04 \times 3 = \$600.00.$$

3. Find the Rate.

No.	INTEREST REQUIRED	PRINCIPAL	TIME	RATE	No.	INTEREST REQUIRED	PRINCIPAL	TIME	RATE
(1)	\$600.00	\$6,000.00	2½ yrs.		(3)	\$1,175.00	\$4,700.00	5 yrs.	
(2)	82.00	4,100.00	6 mos.		(4)	182.00	800.00	3½ "	

FINDING PRINCIPAL, TIME AND RATE

1. What sum must be invested at 5% per annum to earn \$525 interest in 3 years?

2. What interest rate per annum must be secured on \$5,000 to earn \$450 interest in 3 years?

3. For how long must \$800 be invested at 6% per annum to earn \$144?

4. A man wishes to invest a sum of money which will earn \$550 a year. If he can secure $5\frac{1}{2}\%$ interest per annum, how much should he invest?

5. How long will it take \$500 to earn \$87.50 at 5% per annum?

6. A sum of money invested at 3% per annum earned \$42.98 in 2 years and 4 months. What was the sum?

7. For how long must \$600 be invested at 4% per annum to earn \$9.60 interest?

8. A man has \$6,000 to invest and wishes to earn \$1,950 in 5 years. What interest rate per annum must he secure?

INTEREST ON PROMISSORY NOTES

Usually, when money is borrowed, it is borrowed on the security of a promissory note. The note states the *date* on which the money was borrowed and the *amount* of money borrowed—called the *face* or the *principal* of the loan. It also states the time of repayment and the *rate* of interest that is to be paid. The note is usually made payable to some person or firm, known as the *payee*, and it is signed by the person making the promise of repayment, who is known as the *maker*. The illustration below is the common form of promissory note.

No. 111	Windsor, Ontario January 15, 19...
Thirty days after date I promise to pay to the order	
of Robert H. Henderson.....	\$500.00
Five Hundred.....	00/100 Dollars
Value Received	
With interest at 6% per annum	M. L. Lowe

In determining the due date of a promissory note, it is customary to add 3 days of grace as provided by law. The interest on a note is calculated to the due date, which includes the 3 days of grace. If the note were made out for 30 days as in the above illustration, the interest to the due date would be calculated on 33 days. If the note is for 3 months, the due date will be 3 days after the corresponding date of the 3rd month from the date on the note. The interest would then be calculated on the time to the due date, which will *include* the 3 days of grace.

EXAMPLE 1—A note for 30 days is dated January 5. When is it due?
 In January there are 31—5 days or 26 days left.
 To make the 30 days, we require 4 days in February.
 To include the 3 days of grace, we require 3 more days in February.
 Therefore, the due date is *February 7*.

EXAMPLE 2—A note is made out for 3 months on January 5. When is it due?
 Three months after January 5 would be April 5.
 To include the 3 days of grace, we require 3 more days in April.
 Therefore, the due date is *April 8*.

Calculate the due date of each of the following notes.

No.	DATE ISSUED	TERMS	DUE DATE	No.	DATE ISSUED	TERMS	DUE DATE
1	Jan. 3, 1957	30 days		6	Mar. 8, 1957	6 months	
2	Oct. 2, 1958	90 days		7	June 11, 1958	2 years	
3	May 15, 1958	3 months		8	Dec. 15, 1958	10 days	
4	Feb. 9, 1959	60 days		9	Mar. 19, 1957	2 months	
5	Nov. 3, 1958	100 days		10	Aug. 3, 1958	50 days	

INTEREST ON PROMISSORY NOTES

EXAMPLE—A 3-month note for \$500, dated Jan. 15, bears interest at 5% per annum. What will be the interest when the note falls due?

Face of Note \$500

Date of Note January 15

Time of Note 3 months

Due Date April 18 (April 15 plus 3 days of grace)

Time Jan. 15 to April 18 = 93 days

Interest $\$500 \times .05 \times \frac{93}{365} = \6.37

1. Calculate the interest on the following notes. Show your solutions in the spaces provided.

No.	FACE	DATE ISSUED	TERMS	RATE OF INTEREST	INTER-EST	No.	FACE	DATE ISSUED	TERMS	RATE OF INTEREST	INTER-EST
1	\$500.00	Jan. 4	30 da.	6%		6	\$150.00	Oct. 8	3 mo.	5%	
2	245.00	Apr. 9	60 da.	4½%		7	850.00	May 11	6 mo.	7%	
3	165.00	Jun. 2	90 da.	5½%		8	305.00	Nov. 7	2 mo.	4%	
4	87.50	Aug. 1	40 da.	6½%		9	510.00	Dec. 3	1 mo.	6%	
5	750.00	Feb. 29	30 da.	7%		10	135.00	July 6	4 mo.	5½%	
Face		(1)	(2)		(3)	(4)		(5)			
Date											
Terms											
Due Date											
Time											
Rate											
Interest											
Face		(6)	(7)		(8)	(9)		(10)			
Date											
Terms											
Due Date											
Time											
Rate											
Interest											

INTEREST ON PROMISSORY NOTES

The information from which the interest is calculated is secured from the promissory note itself.

1. Find the interest payable on the due date for the following promissory notes. Show your solutions in the spaces provided.

No. 1 Windsor, Ontario May 15, 195-
30 days after date I promise to pay to the
order of L. L. Lane.....\$450.00
Four Hundred and Fifty..00/100 Dollars

Value Received

With interest at 6% per annum.

N. L. Rose

No. 2 Windsor, Ontario March 8, 195-
60 days after date I promise to pay to the
order of B. M. Main.....\$175.00
One Hundred and Seventy-five
.....xx/100 Dollars

Value Received

With interest at 5% per annum.

L. Lonnee

No. 3 Chatham, Ontario June 8, 195-
3 months after date I promise to pay to
the order of K. L. Fell.....\$187.50
One Hundred and Eighty-seven
.....50/100 Dollars

Value Received.

With interest at 5½% per annum.

B. B. Beasley

No. 4 Essex, Ontario July 15, 195-
6 months after date I promise to pay to
the order of S. B. King.....\$1,500.00
Fifteen Hundred.....00/100 Dollars

Value Received.

With interest at 7% per annum

S. M. Moore

No. 5 London, Ontario August 7, 195-
90 days after date I promise to pay to the
order of King & Sons.....\$432.50
Four Hundred and Thirty-two
.....50/100 Dollars

Value Received.

With interest at 4½% per annum.

R. B. Brown

No. 6 Kingston, Ontario May 8, 195-
1 month after date I promise to pay to
the order of Wray & Co.....\$1150.00
Eleven Hundred and Fifty
.....00/100 Dollars

Value Received.

With interest at 6% per annum.

S. S. Lennon

(1)

(2)

(3)

(4)

(5)

(6)

Face						
Date						
Terms						
Due Date						
Time						
Rate						
Int. Formula						
Interest						

INTEREST ON BANK SAVINGS ACCOUNTS

It is the practice of Canadian Banks to pay interest on the money which they hold in savings accounts for depositors. This interest is paid twice yearly, and is calculated on the minimum quarterly balance separately for each quarter of the year. The minimum quarterly balance is the smallest amount on deposit at any one time during the quarter year. It is the present practice of the banks to calculate the interest and add it to the balance of the account on May 31 and November 30 at the rate of 2 per cent per annum.

EXAMPLE—Calculate the interest due on the following savings account as of November 30 at 2 per cent per annum, calculated half-yearly on the minimum quarterly balance.

DATE 19..		INITIAL	WITHDRAWAL		DEPOSIT	BALANCE
May	31	Bal.				167 50
June	7				100 00	267 50
July	15		50 00			217 50
August	3				75 00	292 50
Sept.	9		10 00			282 50
Oct.	13	Int.			37 50	320 00
Nov.	7		150 00			170 00
	23				85 00	275 00
	30				1 69	276 69

The minimum balance in the quarter year composed of June, July and August is \$167.50. (The balance from June 1 to June 7.)

The interest is $\$167.50 \times .02 \times \frac{1}{4} = \$.84$ for the first quarter.

The minimum balance in the quarter year composed of September, October and November is \$170. (The balance from Nov. 7 to Nov. 23).

The interest is $\$170 \times .02 \times \frac{1}{4} = \$.85$.

Therefore, the interest due on November 30 is \$.84 plus \$.85, which equals \$1.69. This has been credited (added) to the account in the illustration above.

Note that 2 per cent for $\frac{1}{4}$ year equals $\frac{1}{2}$ per cent and, therefore, we can most easily use the 1 Per Cent Method.

1. Using the method shown above, find the interest on November 30 for the following accounts. Enter your answer in the account as in the illustration.

(1)

DATE 19..		INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE
May	31	Bal.			113 10
June	8			16 20	129 30
	19		31 15		98 15
July	3			34 30	132 45
	9		10 00		122 45
Aug.	6			40 00	162 45
	20			21 50	183 95
Sept.	8		5 00		178 95
Oct.	11			20 00	198 95

(2)

DATE 19..		INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE
May	31	Bal.			84 06
June	11			62 10	146 16
July	3			81 00	227 00
Aug.	9		40 00		187 16
	31			25 00	212 16
Sept.	1		10 00		202 16
Oct.	19		100 00		102 16
Nov.	14			50 00	152 16
	19			15 00	167 16

INTEREST ON BANK SAVINGS ACCOUNTS

1. Calculate the interest due on the following accounts on May 31 or November 30.

(1)

DATE 19..	INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE	DATE 19..	INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE
Nov. 30	Bal.			954 43	May 31	Int.		1 54	345 54
Dec. 8			300 00	1254 43	June 7		100 00		245 54
23		175 50		1078 93	July 13			235 00	480 54
Jan. 9		76 15		1002 78	Aug. 9		13 50		467 04
Feb. 14		123 18		879 60	17			200 00	667 04
23			50 00	929 60	Sep. 11		10 00		657 04
Mar. 3		22 50		907 10	Oct. 4			100 00	757 04
19			25 00	932 10	15		120 00		637 04
Apr. 8		145 00		787 10	Nov. 17			30 00	667 04
May 12		54 18		732 92	23		67 94		599 10
31	Int.				30	Int.			

(2)

(3)

DATE 19..	INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE	DATE 19..	INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE
Nov. 30	Int.		2 18	178 01	May 31	Int.		2 74	578 18
Dec. 5		15 00		163 01	June 5		10 00		568 18
11			35 00	198 01	19		20 00		548 18
Jan. 9			100 00	298 01	30			75 00	623 18
17			81 00	379 01	July 7			9 00	632 18
Feb. 11		45 15		333 86	24			40 00	672 18
23			23 85	357 71	31			10 00	682 18
Mar. 8		21 15		336 56	Aug. 7		50 00		632 18
19			120 00	456 56	25		50 00		582 18
31		9 50		447 06	Sep. 9			20 00	602 18
Apr. 3			20 00	467 06	21			5 00	607 18
9			20 00	487 06	30		7 45		599 73
17			20 00	507 06	Oct. 5			25 00	624 73
30		13 15		493 91	11		10 00		614 73
May 3			20 00	513 91	Nov. 30	Int.			
10			20 00	533 91					
31	Int.								

(4)

(5)

DATE 19..	INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE	DATE 19..	INITIAL	WITH- DRAWAL	DEPOSIT	BALANCE
Nov. 30	Int.		1 83	178 98	May 31	Int.		3 45	434 43
Dec. 18		5 00		173 98	June 3			20 00	454 34
23		50 00		123 98	18			9 00	463 43
Jan. 9			25 00	148 98	July 17			87 50	550 93
23			25 00	173 98	28		50 00		500 93
Feb. 6			25 00	198 98	Aug. 7			23 50	524 43
20			25 00	223 98	29			10 00	534 43
Mar. 6			25 00	248 98	Sep. 9			60 00	594 43
15		35 15		213 83	19			35 00	629 43
20			25 00	238 83	Oct. 3			15 00	644 43
Apr. 3			25 00	263 83	17		20 00		624 43
17			25 00	288 83	Nov. 7		35 00		589 43
May 31	Int.				30	Int.			

(6)

INTEREST ON BANK OVERDRAFTS

When a current account is overdrawn, the banks charge interest on the amount of the overdraft. Since the overdraft will vary with each cheque and deposit, and because it would be inconvenient to calculate it each day, the interest is calculated at the end of each month on the total of the daily overdrafts. Practice varies, in that to simplify the calculation, some banks take the overdraft to the nearest even \$100, and others to the nearest even \$1.

EXAMPLE—Find the interest on the overdraft in the following current account at 6 per cent per annum, taking the overdraft to the nearest even \$100. Note that a debit balance is an overdraft.

DATE 19--	MEMO.	CHEQUES	DEPOSITS	DR. OR CR.	BALANCE
Jan 1	Bal.			Dr.	601 00
3		150 00		Dr.	751 00
5			200 00	Dr.	551 00
9		63 50		Dr.	614 50
15		75 00		Dr.	689 50
23			500 00	Dr.	189 50
25			200 00	Cr.	10 50
26		125 50		Dr.	115 00
29		45 00		Dr.	160 00
31	Int.	2 58		Dr.	162 58

In a column providing a line for each day of the month, as shown to the right, list the overdraft for each day to the nearest \$100.

Note that each balance is a debit balance except that of January 25. The total number of \$100's is 157. Therefore, the equivalent overdraft for one day is \$15,700. The interest is:

$$\$15,700 \times 1/365 \times .06 = \$2.58.$$

This amount has been added to the overdraft in the account above.

1. Taking the daily overdraft to the nearest \$100, calculate the interest on the current accounts shown in Problem 1. Use columns 2 and 3.

2. Taking the daily overdraft to the nearest \$1, calculate the interest on the current accounts shown in Problem 2. Use columns 4 and 5.

DAY	AMOUNT OF DAILY OVERDRAFTS				
	1	2	3	4	5
1	6				
2	6				
3	8				
4	8				
5	6				
6	6				
7	6				
8	6				
9	6				
10	6				
11	6				
12	6				
13	6				
14	6				
15	7				
16	7				
17	7				
18	7				
19	7				
20	7				
21	7				
22	7				
23	2				
24	2				
25	0				
26	1				
27	1				
28	1				
29	2				
30	2				
31	2				
	157				

No.	INTEREST FORMULA	ANSWER
2		
3		
4		
5		

1.

2.

DATE 19--	MEMO.	CHEQUES	DEPOSITS	DR. OR CR.	BALANCE
Aug 1	Bal.			Dr.	921 50
4		201 50		Dr.	1123 00
7		116 10		Dr.	1239 10
11			200 00	Dr.	1039 10
15			35 00	Dr.	1004 10
21		100 00		Dr.	1104 10
24		200 00		Dr.	1304 10
30			600 00	Dr.	704 10

DATE 19--	MEMO.	CHEQUES	DEPOSITS	DR. OR CR.	BALANCE
Apr 1	Bal.			Cr.	601 80
3		1000 00		Dr.	398 20
7		100 00		Dr.	498 20
10			500 00	Cr.	180
15		200 00		Dr.	198 20
21		300 00		Dr.	498 20
27		200 00		Dr.	698 20
29			400 00	Dr.	298 20

DISCOUNTING NON-INTEREST BEARING PROMISSORY NOTES AND DRAFTS

When a business man wishes to borrow from a bank, he usually signs a promissory note which the bank *discounts* at the current rate of interest. In discounting the note, the bank deducts the interest for the period of the note and lends the business man the balance. The full amount of the note is then repaid by the borrower on the due date. It is also possible for the business man to discount notes and drafts which have been made payable to him, and in these cases the bank deducts the *discount* (interest on the face until due) and gives the business man the *proceeds* or balance. Notes and drafts may be discounted on the day they are made out or on any day before maturity.

EXAMPLE 1—A business man borrows \$500 by discounting his 60-day note on May 1 at the bank at 6% interest. Find the proceeds.

The bank discount will be calculated for 63 days—May 1 to the due date July 2, including 3 days of grace.

$$\text{Discount} = \$500 \times .06 \times \frac{63}{365} = \$5.18.$$

$$\text{Proceeds} = \$500 - \$5.18 = \$494.82.$$

EXAMPLE 2—K. B. Jones holds the following promissory note signed by L. Lennow. What would be the proceeds if it were discounted at 6% on March 28?

\$150.00	Windsor, Ontario, March 5, 19...
Ninety days after date I promise to pay to	
K. B. Jones.....or order	
One hundred and fifty.....00/100 Dollars	
Value received	<i>L. Lennow</i>

The due date will be June 6.

The discount time from March 28 to June 6 is 70 days.

$$\text{Discount} = \$150 \times .06 \times \frac{70}{365} = \$1.73.$$

$$\text{Proceeds} = \$150 - \$1.73 = \$148.27.$$

Note that the *discount time*, the period for which the bank charges discount, is always that period from the date the note is discounted to the due date.

1. Find the proceeds in each of the following transactions. The rate of discount is 6%.

(1) A business man borrows from the bank by discounting his 90-day note for \$1,000 on June 5.	(2) A business man borrows \$730 from the bank by discounting his 3-month promissory note on July 7.
(3) A 60-day note for \$450 dated May 10 is discounted on June 1.	(4) A 6-month note dated January 15, 1955, for \$300 is discounted on April 8.

DISCOUNTING NON-INTEREST-BEARING PROMISSORY NOTES AND DRAFTS

1. Complete the following table, showing solutions in the spaces provided.

No.	FACE OF NOTE	DATE MADE	TERMS	DUE DATE	DISCOUNT DATE	DISCOUNT TIME	DISCOUNT RATE	DISCOUNT		PROCEEDS	
1	\$450.00	June 6	30 da.		June 14		6%				
2	200.00	May 11	90 "		May 31		6%				
3	345.00	Dec. 8	6 mo.		Dec. 15		5%				
4	500.00	Oct. 1	90 da.		Oct. 15		6%				
5	750.00	June 9	3 mo.		July 30		6½%				
6	100.00	Aug. 31	30 da.		Sept. 15		5%				
7	1,000.00	May 30	60 "		May 30		6%				
8	910.00	Nov. 14	1 mo.		Dec. 1		5½%				
9	85.50	Feb. 28	3 "		Mar. 3		6%				
10	645.45	Apr. 3	90 da.		Apr. 8		6%				

(1)

(2)

(3)

(4)

(5)

(6)

(7)

(8)

(9)

(10)

SIMPLE INTEREST—DISCOUNTING NON-INTEREST-BEARING PROMISSORY NOTES AND DRAFTS

It is common practice for the business man to draw drafts on his customers for the purpose of discounting them to secure ready cash.

EXAMPLE—On March 15, Lowe and Company sold B. Benson an invoice of goods amounting to \$400; terms, net 60 days. On March 25, in order to get ready cash, Lowe and Company drew the following draft on B. Benson.

\$400.00	Windsor, Ontario March 25, 195...
Fifty days after date pay to the order of	
LOWE AND COMPANY	
Four hundred.....00/100 Dollars	
Value received and charge to the account of	
To B. Benson Belleville, Ontario	LOWE AND COMPANY per <i>L. L. Lowe</i>

Lowe and Company may discount this draft immediately, in which case the bank will forward it for acceptance and collection on the due date; or they may ask B. Benson to accept it (write the word "accepted" across the face of it and sign it) and return it to them, at which time they may discount it.

EXAMPLE 1—Lowe and Company discount the draft immediately on March 25, the bank charging 6% discount. What are the proceeds?

The due date for the draft is May 17.

The discount period is 53 days (March 25 to May 17).

The discount is $\$400 \times .06 \times 53/365 = \3.48 .

The proceeds are $\$400 - \$3.48 = \$396.52$.

EXAMPLE 2—Lowe and Company discount the draft on March 29 when it is returned after acceptance by B. Benson. What are the proceeds?

The due date is May 17.

The discount period is 49 days (March 29 to May 17).

The discount is $\$400 \times .06 \times 49/365 = \3.22 .

The proceeds are $\$400 - \$3.22 = \$396.78$.

1. Find the proceeds of the following draft (a) if discounted the day it is drawn, (b) if discounted when it is returned accepted 3 days later. The rate of discount is 6%. Proceeds are (a)_____ (b)_____.

\$525.00	Chatham, Ontario January 23, 195..
Ninety days after date pay to the order of	
R. L. KENNEDY AND COMPANY	
Five hundred and twenty-five.....00/100 Dollars	
Value received and charge to the account of	
To Lowe and Company Windsor, Ontario	R. L. KENNEDY AND CO. per <i>R. L. Kennedy</i>

SIMPLE INTEREST—DISCOUNTING NON-INTEREST-BEARING PROMISSORY NOTES AND DRAFTS

1. Find the proceeds from discounting the following drafts. Show your solutions in the spaces provided.

No.	FACE OF DRAFT	DATE OF DRAFT	TIME OF DRAFT	DATE DISCOUNTED	RATE OF DISCOUNT	PROCEEDS	
1	\$ 500.00	January 5/58	60 days	January 5/58	6%		
2	750.00	January 9/59	30 days	February 3/59	6%		
3	615.15	June 7, 1959	20 days	June 10, 1959	5%		
4	219.50	April 3, 1959	3 months	April 30/59	6%		
5	437.75	October 9/59	90 days	October 15, 1959	7%		
6	1,219.50	August 5/58	2 months	Sept. 9, 1958	6%		
7	302.50	November 7/59	1 month	Nov. 10, 1959	6%		
8	69.75	December 3/59	60 days	Dec. 15, 1959	6%		

(1)	(2)
(3)	(4)
(5)	(6)
(7)	(8)

DISCOUNTING INTEREST-BEARING NOTES

Interest-bearing promissory notes may be discounted in the same manner as non-interest-bearing notes and drafts. However, the bank discounts the amount of the note at maturity—the face of the note plus the interest. It is therefore necessary to determine the interest due on the note at maturity and add it to the face of the note before calculating the discount.

EXAMPLE—A 60-day note for \$350, dated January 7, 19-- and bearing interest at 5% per annum is discounted on January 30 at 6% per annum. Find the proceeds.

Interest to maturity = $\$350 \times .05 \times 63/365 = \3.02 .

Value at maturity = $\$350$ plus $\$3.02 = \353.02 .

Due date of the note is March 11.

Discount period is 40 days (January 30 to March 11).

Discount = $\$353.02 \times .06 \times 40/365 = \2.32 .

Proceeds = $\$353.02 - \$2.32 = \$350.70$.

1. Find the proceeds on each of the following notes. Show your solution in the spaces provided.

No.	FACE OF NOTE	INTEREST RATE	DATE OF NOTE	TIME OF NOTE	DATE DISCOUNTED	DISCOUNT RATE	DISCOUNT TIME	PROCEEDS
1	\$650.00	5%	May 3	30 days	May 8	6%		
2	250.00	5½%	June 9	90 days	June 15	6%		
3	175.00	6%	Oct. 17	1 month	Oct. 20	7%		
4	295.00	5%	Dec. 7	3 months	Dec. 30	6%		
(1)					(2)			
(3)					(4)			

PROBLEMS OF SIMPLE INTEREST

1. L. King borrowed \$650 from his insurance company on security of his own policy, interest to be paid every six months at 6% per annum. How much interest will he pay if he keeps the loan for $2\frac{1}{2}$ years?

2. M. Mennie inherited the following bonds which earned interest at $2\frac{1}{2}\%$ per annum: five of \$500 each; seven of \$1,000 each; and twelve of \$5,000 each. What will be his monthly income from these bonds?

3. A man paid \$7,500 for a house. He rented it for \$75 a month. If taxes and upkeep amount to \$310 a year, what interest rate per annum does he earn on his investment?

4. A gold stock was purchased for \$3.10 a share. It paid a dividend of 15 cents a share, and was sold a year later for \$3.60 a share. How much did an investor gain if he had purchased 1,000 shares? What is the gain per cent per annum on his investment?

5. A graduate of a school wishes to grant an annual scholarship of \$500. How much in $3\frac{1}{2}\%$ bonds must he set aside to earn this amount each year?

6. A man purchased an automobile for \$2,500. A year later he sold it for \$1,900. If he drove it 5,710 miles at a cost of $5\frac{1}{2}$ cents a mile for gasoline and oil, what was his cost for transportation for the year if money is worth 6% per annum?

PROBLEMS OF SIMPLE INTEREST

7. A man holds a 6-month note for \$1,000, dated October 15, bearing interest at 5%. What will his proceeds be if he discounts it on December 1, of the same year at 6%?

8. On June 10, a business man who needs ready cash has a customer who owes him \$1,800 on account, but the debt is not due for 30 days. If he draws a 30-day draft on the customer for \$1,800 on June 10 and discounts it immediately at 6%, what amount of cash will he net?

9. A company, on closing its books on December 31, holds 2 interest-bearing notes as follows: \$1,000, dated September 15 for 6 months with interest at 5%; and \$500 dated November 2 for 60 days, with interest at 6%. What is the accrued interest on these notes on December 31?

10. A company, on closing its books on December 31, has 2 notes outstanding against it as follows: \$750, dated December 3 for 60 days with interest at 5%; and \$900, dated November 16 for 3 months with interest at $5\frac{1}{2}\%$. What is the accrued interest on these notes on December 31?

11. On May 1, 1958, a man buys a house for \$5,200, paying \$4,000 cash and giving a mortgage for \$1,200 bearing interest at $5\frac{1}{2}\%$ per annum, to be paid off in 3 years by equal half-yearly payments of principal plus interest. What is the date and the amount of each of the 6 payments?

12. On November 26, 1958, after a regular half-yearly payment, the balance of a mortgage is \$1,050. If it bears interest at 6% per annum, what amount will pay it off in full on January 19, 1959?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Find the interest on each of the following notes.

- (1) \$500 for 1 year at 6% = _____
 300 for 73 days " 5% = _____
 146 for 1 year " 7% = _____
 240 for 3 months " 8% = _____
 365 for 25 days " 4% = _____

- (2) \$700 for 2 years at 5% = _____
 200 for 5 " " 6% = _____
 900 for 6 months " 4% = _____
 50 for 3 years " 3% = _____
 400 for 2½ years " 4% = _____

Total _____

Total _____

2. Express each of the following as a per cent, as a common fraction, and as a decimal. Provide the missing equivalents.

- | | | | |
|----------------------|---------------------|----------------------|------------------------|
| (1) .70 | (2) $\frac{3}{5}$ | (3) 1.45 | (4) $2\frac{1}{2}\%$ |
| (5) .15 | (6) $\frac{5}{8}$ | (7) .02 | (8) 15% |
| (9) $.12\frac{1}{2}$ | (10) $\frac{2}{3}$ | (11) 13% | (12) $37\frac{1}{2}\%$ |
| (13) $\frac{1}{3}$ | (14) $\frac{1}{6}$ | (15) .0625 | (16) .006 |
| (17) $\frac{2}{5}$ | (18) $\frac{3}{40}$ | (19) $\frac{1}{2}\%$ | (20) .19 |

3. Multiply the following.

- | | | |
|------------------------------------|------------------------------------|---------------------------|
| (1) $2428 \times \$.25 =$ | (5) $244 \times \$2.50 =$ | (9) $164 \times \$5.00 =$ |
| (2) $4242 \times .12\frac{1}{2} =$ | (6) $366 \times 1.33\frac{1}{3} =$ | (10) $248 \times 1.25 =$ |
| (3) $180 \times .16\frac{2}{3} =$ | (7) $180 \times .75 =$ | (11) $144 \times 7.50 =$ |
| (4) $330 \times .10 =$ | (8) $150 \times .66\frac{2}{3} =$ | (12) $450 \times 1.50 =$ |

4. Total the following both vertically and horizontally.

12345	17864	34567	1895	98764	19876	_____
45710	11987	13450	1894	1897	1109	_____
3454	11457	8765	19876	34576	87654	_____
18764	8765	18747	7874	34567	8755	_____
765	17876	8765	34523	2323	34455	_____
=====	=====	=====	=====	=====	=====	=====

5. Total the following both vertically and horizontally.

$8\frac{1}{4}$	$87\frac{1}{2}$	$34\frac{3}{4}$	$14\frac{3}{4}$	$9\frac{3}{8}$	$11\frac{1}{4}$	_____
$16\frac{3}{4}$	$12\frac{3}{8}$	$9\frac{1}{8}$	$34\frac{1}{4}$	$17\frac{7}{8}$	$34\frac{1}{16}$	_____
$21\frac{5}{8}$	$9\frac{7}{8}$	$17\frac{3}{4}$	$19\frac{7}{8}$	$1\frac{1}{4}$	$9\frac{3}{4}$	_____
$41\frac{1}{2}$	$22\frac{1}{2}$	$34\frac{1}{16}$	$41\frac{1}{2}$	$45\frac{9}{16}$	$11\frac{7}{16}$	_____
$9\frac{1}{4}$	$9\frac{1}{8}$	$11\frac{3}{16}$	$12\frac{5}{8}$	$7\frac{7}{8}$	$23\frac{9}{16}$	_____
$17\frac{3}{16}$	$11\frac{1}{4}$	$67\frac{1}{8}$	$87\frac{3}{16}$	$1\frac{5}{8}$	$11\frac{3}{4}$	_____
$21\frac{1}{8}$	$8\frac{7}{8}$	$15\frac{1}{2}$	$22\frac{3}{4}$	$15\frac{3}{4}$	$19\frac{1}{2}$	_____
=====	=====	=====	=====	=====	=====	=====

UNIT 8

DOMESTIC AND FOREIGN EXCHANGE

DOMESTIC EXCHANGE

Exchange is the term used to refer to the cost of transferring money from one location to another. When these locations are both within the country, the exchange is described as domestic.

When a business man wishes to pay an amount in another community within the country, he may do so by:

1. Mailing the cash by registered or ordinary mail.
2. Sending a postal money order.
3. Sending an express money order.
4. Sending a bank draft or bank money order.
5. Sending a cheque drawn on his own bank account.

Method 1 is infrequently used, and then only for small coins. Methods 2, 3 and 4 are convenient if the sender does not have a bank account, or sufficient money in a bank account. Method 5 is the most convenient and the most frequently used method. In each of these methods, there is some cost in getting the money from one place to the other—exchange. The person purchasing a postal money order, an express money order or bank draft pays the exchange when it is purchased. The person who receives an out-of-town cheque pays the exchange when the cheque is cashed or deposited.

The rate of exchange on out-of-town cheques varies according to whether the bank at which the cheque is cashed is an agent of the bank on which it is drawn, and also according to the amount of the cheque. Usually, no charge is made for those cheques drawn on another bank in the same community; that is, on local cheques.

It is common practice for the banks to charge $\frac{1}{8}$ per cent on out-of-town cheques which are drawn on its own branches or on the branches of its agents, and to charge $\frac{1}{4}$ per cent on out-of-town cheques drawn on other banks. In the first case, the minimum charge is 15 cents, and in the latter, it is 25 cents. The rates charged vary according to the amount of the cheque, but the following is an exchange rate table currently being used by a local bank for out-of-town cheques drawn on its own branches or those of its agents.

AMOUNT OF CHEQUE				RATE OF EXCHANGE		
	\$10 and under			10 cent Minimum		
Over	10	up to	\$2,500	$\frac{1}{8}\%$	"	\$.15
"	2,500	" "	5,000	$\frac{1}{10}\%$	"	3.15
"	5,000	" "	25,000	$\frac{1}{6}\%$	"	5.00
"	25,000	" "	100,000	$\frac{1}{32}\%$	"	15.65

All higher rates are set at the discretion of the bank manager.

Calculating the Exchange

EXAMPLE—Find the exchange on an out-of-town cheque drawn on a bank which is an agent of the bank at which it is cashed. The amount of the cheque is (a) \$175. (b) \$2,600.

(a) Since the amount is \$175, and it is drawn on an agent bank, the rate is $\frac{1}{8}\%$.

$\frac{1}{8}\%$ of \$175 = 8) 1.75 = .22, or 22 cents.

(b) As the amount is \$2,600, and it is drawn on an agent bank, the rate, reading from the table, is $\frac{1}{10}\%$.

$\frac{1}{10}\%$ of \$2,600 = 10) 26.00 = \$2.60, which is less than the minimum. Therefore, the exchange would be the minimum charge of \$3.15.

DOMESTIC EXCHANGE

1. Using the Exchange Table on page 105, calculate the exchange on the following cheques.

(1) \$7.50	(2) \$319.75	(3) \$2,315.00
(4) \$451.45	(5) \$117.34	(6) \$515.45
(7) \$89.45	(8) \$23.56	(9) \$4,500.00
(10) \$198.78	(11) \$675.50	(12) \$5,775.00
(13) \$345.90	(14) \$172.00	(15) \$125.00

2. Complete the deposit slip for the following deposit.

On May 1, 19—, you deposit for Lowe and Company the following bills: 47 ones, 22 twos, 17 fives, 11 tens, 9 twenties, and 3 fifties. The deposit includes \$34.23 in silver and copper and the following cheques: Drawn on local banks: \$14.50, \$35.45, \$451.32, \$76.45, \$14.35, \$4.50, \$23.85. Drawn on out-of-town banks: \$49.50, \$269.55, \$62.50, \$43.29, \$15.40, \$816.95 and \$37.25. Omit the name for the cheques and calculate the exchange, using the table on page 75.

Secure a deposit slip at a bank and complete it for the following deposit: 78 ones, 27 twos, 18 fives, 19 tens, 11 twenties, 5 fifties, 7 hundreds; \$78.56 in coin, and in cheques as follows: Local: \$34.75, \$78.65, \$84.97. Out-of-Town: \$78.55; \$178.50, \$345.90, \$187.95, \$817.75, and \$56.25. Use the table on page 75 to calculate the exchange.

NATIONAL BANK			Date _____		
19__					
CREDIT			Name of Customer		
			Name	Cheques	Ex'h'g.
×	1 =				
×	2 =				
×	5 =				
×	10 =				
×	20 =				
×	50 =				
×	100 =				
	Silver	\$			
	Copper				
	Cheque				
Less Exchange					
Total					

3. A firm has the following payments to be made by cheque to settle out-of-town accounts. Calculate the amount for which each cheque should be written, considering the discount and adding exchange at $\frac{1}{2}\%$.

(1) \$150.00 less 2%	(2) \$61.00 net	(3) \$1,915.00 less 1%	(4) \$2,408.00 less 2%
(5) \$917.75 net	(6) \$1,615.36 less 3%	(7) \$175.00 less 1%	(8) \$275.40 less 2%

FOREIGN EXCHANGE

Remittances to or from countries outside Canada involve *foreign exchange*. The rate of exchange refers to the value of the currency of one country in terms of the currency of another. At one time, the currency of most countries could be exchanged for gold, and the relative values of different currencies could be determined by the amount of gold for which they could be exchanged. The fixed exchange values so determined were called *par* values. When a foreign currency can be secured for less Canadian currency than this par value, it is said to be at a discount; and when it costs more, it is said to be at a premium.

The values of foreign currencies or monetary units vary from day to day according to the demand for them in Canada. These values may be secured from your local bank.

The following table gives the values in Canadian dollars of some foreign monetary units as reported recently by a local bank.

COUNTRY	MONETARY UNIT	CANADIAN DOLLAR	COUNTRY	MONETARY UNIT	CANADIAN DOLLAR
Austria	Schilling	\$.04718	Italy	Lira	\$.00162
Australia	Pound	2.249	Jamaica	Pound	2.79
Belgium	Franc	.02005	Mexico	Peso	.1166
British West Indies	Dollar	.5883	Netherlands	Florin	.2654
Brazil	Cruzeiro	.05451	" West Indies	Florin	.5347
Colombia	Peso	.4034	New Zealand	Pound	2.79
Czechoslovakia	Korina	.0217	Norway	Krone	.1412
Denmark	Krone	.146	Pakistan	Rupee	.3048
Egypt	Pound	2.8958	Portugal	Escudo	.03516
France	Franc	.002881	Singapore	Dollar	.3294
West Germany	Mark	.2401	Sweden	Krona	.1949
Guatemala	Quetzal	1.0084	Switzerland	Franc	.2309
Hong Kong	Dollar	.1765	Union of South Africa	Pound	2.79
India	Rupee	.2118	United Kingdom	Pound	2.79

The Canadian banks will buy or sell foreign currencies—selling for a little more than the price at which they buy.

Changing Foreign Currencies to Canadian Dollar Values

EXAMPLE 1—An article costs 175 pesos in Mexico. What is its value in Canadian dollars?

1 peso = \$.1166.

Therefore, 175 pesos = $175 \times \$.1166 = \20.41 .

EXAMPLE 2—How many Indian rupees can be secured in exchange for \$42.36 in Canadian money?

1 rupee = \$.2118.

Therefore, \$42.36 will buy $\$42.36 \div .2118$ or 200 rupees.

1. Considering the above table as the bank's buying price, find the value of the following foreign bills of exchange.

(1) 100 Schillings	(6) 175 Belgian Francs	(11) 250 Indian Rupees
(2) 75 Hong Kong Dollars	(7) 400 Swedish Krona	(12) 1,000 W. Ger. Marks
(3) 750 Lira	(8) 150 Cruzeiro	(13) 75 Dutch Florins
(4) 150 Escudos	(9) 350 Quetzals	(14) 25 Br. Pounds
(5) 1,200 French Francs	(10) 950 Switz francs	(15) 10 Mexican Pesos

The American money system is the same as that of Canada, and when the currencies of the two countries are at par, an American dollar exchanges evenly for a Canadian dollar.

The English money system is quite different from that of Canada. The English monetary unit is the pound sterling, and when it is at par with the Canadian dollar, it is valued at \$4.8665. The pound sterling is composed of 20 shillings, and one shilling is composed of 12 pence.

Because Canada has a great volume of trade with both the United States and Great Britain, most Canadian newspapers publish the rates of exchange with these two countries daily. At the time this book was prepared, the banks were buying American dollars for .98 Canadian and selling them for .99. They were buying pound sterling for \$2.76 and selling for \$2.79.

When goods are purchased in the United States, the prices are quoted in American dollars, and because our systems are the same, there is no great problem in converting the American price to Canadian dollars.

EXAMPLE—A radio costs \$19.95 in the United States. What is its price in Canadian dollars if an American dollar is worth 99 cents in Canadian money?
 The banks charge 99 cents in Canadian money for \$1 American.
 Therefore, \$19.95 in American currency is equivalent to $19.95 \times .99$ or \$19.75 in Canadian currency.

When goods are purchased in Great Britain, the prices are quoted in pounds (£), shillings (s.), and pence (d.). To convert these prices to Canadian dollars either of the following two methods may be used.

EXAMPLE—A radio costs £5 7s. 6d. in England. What is its price in Canadian dollars?

COMMON FRACTIONAL METHOD

£1 = \$2.79 (the bank's selling price).
 $£5 = 5 \times \$2.79 = \13.95
 $7 \text{ shillings} = 7/20 \times \$2.79 = .9765$
 $6 \text{ pence} = 6/240 \times \$2.79 = .06975$
 Therefore, £5 7s. 6d. = \$14.99625 = \$15.00.

DECIMAL FRACTIONAL METHOD

1 shilling = 1/20 of a pound = £.05.
 6 pence = 6/240 of a pound = £.025.
 Therefore, £5 7s. 6d. = £5 + £.35 + £.025 = £5.375.
 One pound = \$2.79.
 Therefore, £5.375 = $5.375 \times 2.79 = 14.99625 = \15.00 .

1. If the pound sterling is worth \$2.79 and the U.S. dollar is worth 99 cents in Canadian dollars, find the value of the following.

(1) \$750.00 U.S.	(2) \$35.45 U.S.	(3) £7 10s. 6d.	(4) £25 15s.	(5) \$1,350.00 U.S.
(6) £143 9s. 6d.	(7) £154 17s. 6d.	(8) \$195.75 U.S.	(9) 19s. 11d.	(10) £67 14s. 9d.

To Convert a Sum of Canadian Money to a Foreign Currency

EXAMPLE 1—How many United States dollars can be purchased for \$10.00 Canadian? (U.S. Dollar = \$.98 $\frac{3}{4}$ Canadian).

\$.98 $\frac{3}{4}$ cents will buy \$1 U.S. currency.

Therefore, \$10.00 will buy $\$10.00 \div .98\frac{3}{4} = \10.13 U.S.

EXAMPLE 2—How many pounds sterling can be purchased for \$10.00 Canadian? (Pound = \$2.78 Canadian.)

\$2.78 will buy £1.

Therefore, \$10.00 will buy $\$10.00 \div 2.78 = £3.597$.

£.597 = .597 \times 20 shillings = 11.94 s.

.94 shillings = .94 \times 12 pence = 11d.

Therefore, \$10.00 will buy £3 11s. 11d.

1. Convert the following sums to United States dollars.

(1) \$150.00 (U.S. dollar = .96 $\frac{1}{2}$)	(2) \$175.00 (U.S. dollar = \$1.02)	(3) \$5,450.00 (U.S. dollar = .99 $\frac{1}{4}$)	(4) \$347.50 (U.S. dollar = 1.10 $\frac{1}{4}$)
(5) \$95.00 (U.S. dollar = 1.07 $\frac{1}{4}$)	(6) \$145.00 (U.S. dollar = .93)	(7) \$875.00 (U.S. dollar = 1.00 $\frac{1}{4}$)	(8) \$15.45 (U.S. dollar = 91 $\frac{1}{4}$)

2. Convert the following sums to pounds, shillings, and pence.

(1) \$194.40 (£ = \$4.86)	(2) \$488.43 (£ = \$4.86)	(3) \$683.55 (£ = \$4.20)	(4) \$56.99 (£ = \$2.78)
(5) \$250.00 (£ = \$2.78)	(6) \$7,500.00 (£ = \$2.81 $\frac{1}{2}$)	(7) \$25.00 (£ = \$2.79)	(8) \$140.00 (£ = \$5.01)

PROBLEMS IN FOREIGN EXCHANGE

1. A stenographer is offered a position in London, England at £15 6s. a week. What would this amount to in Canadian money? (£ = \$2.78½)

2. An apartment in Toronto, Ontario rents for \$110 a month. A similar apartment in Liverpool, England rents for £38 15s. Which rent is greater, and by how much? (£ = \$2.77½)

3. A person living in Canada has an income of £215 15s. a month from an estate in England. How much is this in Canadian money? (£ = \$2.78)

4. A business man in Ontario wishes to open a bank account in New York. If he wishes to deposit \$5,000, how much will this cost? (U.S. \$ = \$.98½)

5. A man living in Windsor, Ontario, but working in Detroit, Michigan, earned \$95 a week. If the U.S. dollar = \$1.09 in Windsor, what is the amount of his weekly earnings in Canadian money?

6. A business man owes £350 9s. 6d. to a creditor in England. What would a draft for this amount cost when the pound was selling for \$2.79¼ in Canada?

7. A merchant in Canada accepts American money at par when it is at a discount of 3¼ cents. If his American business averages \$150 a day, 7 days a week, how much did he lose during March as a result of this policy?

8. A tourist planning a trip to England wishes to convert \$500 to English money. If the pound is selling for \$2.81, how much will he get in pounds, shillings and pence?

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Add the following and convert the total to Canadian dollars. (£ = \$2.78)

(1) £ 46 15s. 6d.
 27 14s. 3d.
 41 8s. 7d.
 225 19s. 5d.
79 3s. 6d.

(2) £129 7s. 5d.
 136 4s. 3d.
 699 5s. 7d.
 307 2s. 2d.
555 19s. —

(3) £621 5s. 3d.
 467 2s. —
 219 14s. 7d.
 308 5s. 11d.
215 4s. 4d.

Canadian Value =

Canadian Value =

Canadian Value =

2. Calculate the following invoices and convert the totals to Canadian dollars. (U.S. dollar = \$.96½)

(1)

15 yd. @ \$1.21		
36 yd. " 4.19		
29 yd. " 3.15		
46 yd. " 4.08		
65 yd. " 3.51		
Total		

(2)

126 lb. @ \$1.45		
210 lb. " .98		
315 lb. " 2.04		
214 lb. " 1.71		
311 lb. " 4.08		
Total		

Value in Canadian dollars =

Value in Canadian dollars =

3. Calculate the following and convert the totals to Canadian dollars (£ = \$2.79)

(1) 200 yd. @ 16s. 4d.
 175 yd. " 9s. 6d.
 509 yd. " 15s. —
 306 yd. " 19s. 6d.
 175 yd. " 14s. 11d. _____

Total _____

(2) 12 doz. @ £5 6s. —. a doz.
 15 doz. " 4 5s. 6d. a doz.
 14 doz. " 7 5s. 9d. a doz.
 15 doz. " 6 4s. 4d. a doz.
 12 doz. " 7 3s. 3d. a doz. _____

Total _____

Value in Canadian dollars =

Value in Canadian dollars =

UNIT 9

REVENUE TAXES

SALES TAX AND EXCISE TAX

As a source of revenue, the Federal Government and to some extent the Provincial governments, levy a *Sales Tax* on manufactured goods. In addition to the sales tax, an *Excise Tax* is levied on certain goods. When the manufacturer bills his customer for goods sold which are subject to sales tax and excise tax, he may bill them with the tax included, or he may show the tax as an addition to the cost of the goods on the invoice. In both cases, of course, the customer pays the tax to the manufacturer, who, in turn, remits to the government. The illustration below shows how these taxes may be indicated on the invoice.

CANADIAN CAMERA COMPANY LIMITED			
Windsor, Ontario			
Sold to Ajax Drug Store 144 North Street Windsor, Ontario		Invoice No. 67345 March 15, 195-	
4 K 135-A-20 films	@ \$2.88		\$11.52
1 Signet 35 Camera			60.95
1 Standard Flashholder			5.78
			<u>\$78.25</u>
	Sales Tax		7.83
	Film Excise Tax 15% on \$11.52		1.73
	Camera " " 15% on 60.95		9.14
			<u>\$96.95</u>
Total of Invoice			

1. Find the total cost of the following purchases.

No.	INITIAL COST	SALES TAX	EXCISE TAX	TOTAL COST	No.	INITIAL COST	SALES TAX	EXCISE TAX	TOTAL COST
1	\$49.50	10%	15%		6	\$1750.00	10%	15%	
2	17.50	10%	25%		7	500 gals. at \$1.50	10%	24 cents Per gal.	
3	87.50	10%	20%						
4	19.87	10%	15%		8	5000 pkges. 20 in each @ 14¢ pkge.	10%	\$4.00 Per 1000	
5	72.50	10%	15%						

2. An automobile is listed at \$2,700.00. This includes a markup of 20%, sales tax of 10%, and excise tax of 15% based on the manufacturer's price to the dealer. Calculate (a) The manufacturer's price to the dealer.
(b) The per cent that the tax is of the list price.

3. A man smokes 5 packages of 20 cigarettes each week. If the price of cigarettes is 33 cents a package, and this includes a 5¢ profit for the retailer and excise and sales tax of 17¢ a package, what is (a) His contribution to the retailer's annual profit? (b) His cost of smoking for a year? (c) The amount of tax he pays on his smoking for a year?

CUSTOMS DUTIES

Duties are taxes levied on goods imported. They are levied either as a per cent of the value—*ad valorem*; or on the basis of quantity—*specific*. The *ad valorem* duty on the imported goods is calculated on the invoice price in Canadian money. The specific duties are calculated on the actual weight or volume of the goods.

In addition to the above custom duties, sales tax and excise tax must be paid on any merchandise imported on which such taxes are levied. The excise and sales taxes are calculated on the *duty-paid* value of the imported merchandise; that is, on the invoice price in Canadian funds plus the customs duties.

The *Tariff* is the term given to the schedule of duties. In this tariff, the goods are listed in alphabetical order, and the rates are shown under three main classes—British Preferential, Most-Favoured Nation, and General. By trade treaties with other countries, the Government of Canada determines which of these classes applies to goods from any specific country.

The most convenient source of information regarding the customs tariff, excise duties, and sales tax is the Hand Book of the Canadian Customs Tariff and Excise Duties. The student may possibly secure a back issue of one of these from a local Customs Broker.

On goods imported from the United Kingdom, there is a further reduction of duty on goods imported directly to a Canadian port from a United Kingdom port. This reduction is 10 per cent of the *duty*, and applies to all goods unless the rate of duty is less than 15% or unless the rate is the same as that for the Most-Favoured Nation group.

Dumping Duties are applied to goods imported into the country, on which the price paid in the country of export is less than the prevailing price for the same goods within that same country. These dumping duties amount, in most cases, to the difference between the price paid and the prevailing price in the country of export, and are added to any other duty payable.

Properly certified invoices are required, in duplicate, for Customs Entry. Every invoice must contain a sufficient and correct description of the goods, and must show in one column the actual price at which the goods have been sold, and in a separate column the fair market value of each article at the time and place of shipment in the country of origin. These invoices must be certified by the exporter.

The table that follows is a list of items and duty rates taken from the Customs Tariff Schedule A.

ITEM OF MERCHANDISE	BRITISH PREFERENTIAL	MOST-FAVOURED NATIONS	GENERAL
Automobiles	Free	17½%	27½%
Balls, rubber for sports, etc.	20%	30	35
Bicycles	20	25	30
Chewing gum, sweetened, and per pound	15 —	25 —	35 ½¢
China Tableware	Free	25	35
Fabrics, Cotton, and per pound	17½	17½ 3¢	27½ 4¢
Fire crackers	Free	22½	25
Gloves, baseball	20	25	45
Golf clubs	20	30	35
Ladies outer Garments, wool and per pound	25 —	27½ —	40 35¢
Boots and Shoes	20	27½	40
Purses	12½	22½	40
Tires, Rubber vehicle	22½	25	35

CUSTOMS DUTIES

Determining the Amount of Duty and Tax

EXAMPLE—A set of dishes imported from the U.S. costs \$95.00 in the U.S. If the ad valorem duty is 35% and sales tax is 10%, and the U.S. dollar is worth 98 cents Canadian, calculate the total duty and tax.

Step 1: Determine the value in Canadian dollars— $\$95 \times .98 = \93.10 .

Step 2: Calculate the duty on the value in Canadian dollars to the nearest dollar— $\$93.00 \times .35 = \32.55 —ad valorem duty.

Step 3: Add the duty to the value in Canadian dollars to get the duty-paid value— $\$93.10 + \$32.55 = \$125.65$ —duty-paid value.

Step 4: Calculate the sales tax on the duty-paid value; base the calculation on the exact amount—10% of \$125.65 = \$12.57—sales tax.

Step 5: Add the duty and sales tax— $\$32.55 + \$12.57 = \$45.12$, the total duty and tax.

NOTE: If there is specific duty, it is calculated and added to the value in Canadian dollars in the same manner as the ad valorem duty, and the duty-paid value then includes the value in Canadian dollars plus the ad valorem and specific duties. If there is excise tax, it is calculated on the duty-paid value in the same manner as the sales tax.

1. Using the schedule of rates on the previous page, calculate the duty and taxes on the following purchases. (The U.S.A. is in the most-favoured nation group.)

<p>1. A set of golf clubs imported from the U.S.A.—cost \$120. (U.S. dollar = 97¢ Canadian.) Sales tax, 10%.</p> <p>Value in Can. Dollars _____</p> <p>Ad valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>	<p>2. 500 yards of cotton material weighing 170 pounds at \$1.75 per yard imported from the U.S.A. (U.S. dollar = \$1.10 Canadian.) Sales Tax, 10%.</p> <p>Value in Can. Dollars _____</p> <p>Ad valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>
<p>3. 12 bicycles at £7 10s each, imported from England. (£ = \$2.81.) Sales Tax, 10%.</p> <p>Value in Can. Dollars _____</p> <p>Ad valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Excise Tax _____</p> <p>Total Duty and Tax _____</p>	<p>4. 100 automobile tires imported from England at £5 6s each, and weighing 30 lb. each. (£ = \$2.79.) Sales tax 10%; Excise tax, 5¢ a pound.</p> <p>Value in Can. Dollars _____</p> <p>Ad valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Excise Tax _____</p> <p>Total Duty and Tax _____</p>

CUSTOMS DUTIES

2. Calculate the duty and tax that must be paid on the following to clear them through customs.

<p>(1) 1 package of cotton goods—53½ lb., invoiced from the U.S.A. at \$111.88. Duty—Ad valorem, 17½%; Specific, 3¢ a lb. Sales tax, 10% (U.S. dollar = \$1.06½.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>	<p>(2) 2 packages of cotton goods, 107 lbs. invoiced from U.S.A. at \$225.30. Duty—Ad valorem, 17½%, Specific, 3¢ a lb. Sales Tax, 10% (U.S. dollar = \$.97.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>
<p>(3) 3 parcels containing 21½ doz. knitted hose valued at £50 6s. 6d. Duty—Ad valorem, 20%; Specific, 50¢ a dozen pairs. Sales Tax, 10%. (£ = \$2.81.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>	<p>(4) One gross of carving knives invoiced from England at £7 9s. a dozen. Duty—Ad Valorem, 10%; Sales Tax, 10%, (£ = \$2.79.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>
<p>(5) 1200 pairs of shoes from the U.S.A. at \$7.25 per pair. Duty, 35%, Sales Tax, 10%. (U.S. dollar = (\$1.11½.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>	<p>(6) 100 watches imported from France at 575 francs each. Duty, 30%; Sales Tax, 10%. (Franc = \$.009.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>
<p>7. 12 gross of cotton dresses from the U.S.A. at \$315 a gross—Total weight, 407 pounds. Duty—Ad Valorem, 17½%; Specific, 3¢ a pound. Sales Tax, 10%. (U.S. dollar = \$.97½.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Total Duty and Tax _____</p>	<p>(8) 10 cameras from the U.S.A. at \$29.50 each. Duty—Ad Valorem, 20%. Sales Tax, 10%; Excise Tax, 15% (U.S. dollar = \$.99.)</p> <p>Value in Can. Dollars _____</p> <p>Ad Valorem Duty _____</p> <p>Specific Duty _____</p> <p>Duty-paid Value _____</p> <p>Sales Tax _____</p> <p>Excise Tax _____</p> <p>Total Duty and Tax _____</p>

CUSTOMS DUTIES

3. Calculate the total cost of the following when imported into Canada.

(1) An automobile purchased in the U.S.A. for \$2,150. (U.S. dollar = \$1.02.) Ad Valorem Duty, 17½%; Sales Tax, 10%; Excise Tax, 10%.

(2) An automobile purchased in England for £308 16s. (£ = \$2.91.) Duty—nil. Sales Tax, 10%; Excise Tax, 10%.

4. Calculate the amount of the following invoices and determine the total duty and taxes. Duty rates are as follows: Balls, 30%; Baskets, 25%; Shoes, 27½%; Gloves, 25%; — Sales Tax, 10%. (Note: Duty is payable on the *net* cost in Canadian funds). Do your figuring on a scratch pad and show your answers in the spaces provided. (U.S. dollar = \$1.02).

PENNSYLVANIA SUPPLY CO.

Sylvania, Pennsylvania

Sold to: Lowe and Company
Windsor, Ontario
Canada

Inv. No. 7788
Date: January 30, 19—
Via: Rail Express
Terms: Net 60 days

COUNTRY OF MANUFACTURE	MARKS & No. ON PKGES.	QUANTITIES AND DESCRIPTION OF GOODS	FAIR MARKET VALUE AT TIME AND PLACE OF SHIPMENT		SELLING PRICE TO PURCHASER IN CANADA	
			PRICE	AMOUNT	PRICE	AMOUNT
U.S.A.	1 Ctn.	1 Gross Volley Balls #A-361	\$4.50		\$4.50	
	4 Ctn.	48 Basketballs #A-497	9.00		9.00	
	1 Ctn.	6 Only Basketball Baskets Regulation ½" Steel	6.25		6.25	

Duty on Balls \$. + Duty on Baskets \$. + Sales Tax = Total Duty \$. + Tax.

SPARLING MANUFACTURING COMPANY

Chicago, Illinois

Sold to: Lowe and Company
Windsor, Ontario
Canada

Inv. No. 19919
Date: January 31, 19—
Via: Rail Express
Terms: Net 90 days

COUNTRY OF MANUFACTURE	MARKS & No. ON PKGES.	QUANTITIES AND DESCRIPTION OF GOODS	FAIR MARKET VALUE AT TIME AND PLACE OF SHIPMENT		SELLING PRICE TO PURCHASER IN CANADA	
			PRICE	AMOUNT	PRICE	AMOUNT
U.S.A.	1 Ctn.	1 Doz. "Trapper Mitts"— A-637	\$8.80 ea.		\$8.80	
	4-623	2 " "Fielders Gloves—B-788	5.90 ea.		5.90	
		4 " pair Baseball shoes	6.20 pr.		6.20	
		Less 10%				

Duty on Mitts and Gloves \$. + Duty on Shoes \$. + Sales Tax = Total Duty \$. + Tax.

PERSONAL INCOME TAX

The Income Tax Act contains the terms of the law on which Personal Income Tax is determined. Summarized here are some of the provisions of the Act which apply to individuals whose earned income of any amount is solely from salary, wages or pension and whose investment income, if any, is not over \$2,400, and who are required to complete the T1 Short Form for income tax returns. All other individuals and those claiming foreign tax credits use Form T1 General. This unit will not consider problems dealing with taxpayers who use the T1 General form.

As the provisions of the Act and the rates of tax vary from year to year, it is suggested that the problems be solved from the information on the "T1 Short" return form for the current year. These are readily available at your local post office or income tax office.

PERSONAL EXEMPTIONS

Basic exemption for everyone	\$1,000.00
Exemption if age 65 or over	500.00
Exemption for Marital Status	1,000.00
(See page 2 of "T1 Short" form for equivalent exemptions.)	
Exemption for Wholly Dependent children—qualified for family allowance each	150.00
Exemption for other dependents	400.00

TAXABLE INCOME

Income from all sources must be included, with the exception of Family Allowance, Unemployment Insurance Benefits, War Disability, Pensions, Non-taxable portion of Pensions or Annuities, Workmen's Compensation payments. From this income, the taxpayer may deduct the following:

1. Payments to an approved Pension Fund.
2. Allowable Union dues.
3. Personal Exemptions (Page 2 of "T1 Short" form).
4. Charitable Donations to a maximum of 10% of Net Income.*
5. Medical Expenses in excess of 4% of Net Income.

RATES OF TAX 1952

(To be used in solving problems if the current table is not available.)

TAXABLE INCOME	TAX	TAXABLE INCOME	TAX
\$1,000 or less	18.5%	\$ 40,000	\$ 18,851 plus 63 % on next \$ 10,000
1,000	\$ 185 plus 20.7% on next \$ 1,000	50,000	25,151 plus 65.5% on next 10,000
2,000	392 plus 23.4% on next 1,000	60,000	31,701 plus 68.5% on next 15,000
3,000	626 plus 22.4% on next 1,000	75,000	41,976 plus 71 % on next 15,000
4,000	850 plus 25.7% on next 2,000	90,000	52,626 plus 74 % on next 10,000
6,000	1,364 plus 30.6% on next 2,000	100,000	60,026 plus 76.5% on next 25,000
8,000	1,976 plus 35.5% on next 2,000	125,000	79,151 plus 79.5% on next 25,000
10,000	2,686 plus 41 % on next 2,000	150,000	99,026 plus 82 % on next 75,000
12,000	3,506 plus 46.5% on next 3,000	225,000	160,526 plus 85 % on next 25,000
15,000	4,901 plus 52 % on next 10,000	250,000	181,776 plus 88 % on next 150,000
25,000	10,101 plus 57.5% on next 10,000	400,000	313,776 plus 91 % on remainder
35,000	15,851 plus 60 % on next 5,000		

**Net Income*—is the income after deducting pension fund and union dues payments.

PERSONAL INCOME TAX

1. What are the personal exemptions for the following individuals?

NO.	AGE	MARITAL STATUS	DEPENDENTS	EXEMPTION	NO.	AGE	MARITAL STATUS	DEPENDENTS	EXEMPTION
1	18	Single	None		6	69	Single	1 age 37	
2	25	Married	None		7	35	Married	1 age 15 2 over 16	
3	66	Single	None		8	39	Married	4 under 16	
4	67	Married	None		9	19	Married—wife earned \$600	None	
5	26	Married	1 aged 9		10	29	Married—wife earned \$400	1 age 10	

2. What are the personal exemptions in the following cases?

(1) A widow, aged 44, who supports in her own home, a dependent mother and two children, aged 3 and 8. \$ _____	(2) A single person, aged 48, who supports in his own home a widowed sister and her two children, aged 19 and 8. \$ _____
(3) A single person aged 66, who keeps an invalid sister in an institution. \$ _____	(4) A single person who is the sole support of a brother, aged 18, who is attending boarding school. \$ _____
(5) A married person, aged 66, whose wife's income was \$510, and who supports a dependent father and an invalid son aged 37. \$ _____	(6) A married person whose wife earned \$840, and whose three children are aged 19, 15 and 12. \$ _____

3. What total amount may be deducted in the following cases for charitable donations and medical expense?

NO.	NET INCOME	CHARITABLE DONATIONS	MEDICAL BILLS	AMOUNT DEDUCTIBLE	NO.	NET INCOME	CHARITABLE DONATIONS	MEDICAL BILLS	AMOUNT DEDUCTIBLE
1	\$2,000	\$ 25	\$135		5	\$7,350	\$425	\$608	
2	4,300	141	391		6	1,400	15	62	
3	2,700	38	65		7	1,710	223	46	
4	3,350	86	172		8	2,955	200	319	

4. Calculate the tax liability in the following cases.

NO.	INCOME	PERSONAL EXEMPTIONS	DEDUCTIBLE CHARITY & MED. BILLS	TAX	NO.	INCOME	PERSONAL EXEMPTIONS	DEDUCTIBLE CHARITY & MED. BILLS	TAX
1	\$1,800	\$1,000	\$ 25		6	\$1,300	\$1,000	\$ 21	
2	2,300	2,000	71		7	2,650	1,750	138	
3	2,200	2,150	40		8	1,590	2,000	41	
4	3,700	2,550	85		9	3,910	2,400	67	
5	4,120	2,600	266		10	6,440	2,300	374	

PERSONAL INCOME TAX

5. Calculate the amount of tax due or refundable on each of the following tax returns.

<p>(1) Taxpayer aged 18, single, no dependents. Income from wages \$1,820.; charitable donations, \$25. Tax deducted at the source, \$139.50.</p>	<p>(2) Taxpayer aged 23, single, supports wholly dependent mother. Income from wages, \$3,310; charitable donations, \$25. Tax deducted at the source, \$236.00.</p>
<p>(3) Taxpayer age 35, married; wife's income nil; son aged 9. Income from wages, \$3,450; charitable donations, \$52; medical bills, \$75. Taxes deducted at the source, \$236.80.</p>	<p>(4) Taxpayer aged 67, married; wife's income, nil; no other dependents. Union dues, \$40; income from salary, \$5,750; charitable donations, \$250; medical expenses, \$485. Tax deducted at the source, \$657.50.</p>
<p>(5) Taxpayer aged 51, married; wife's income, \$700, two children aged 20 and 14. Income from salary, \$7,300; income from interest on bonds, \$150; pension plan payments, \$400; charitable donations, \$150. Tax deducted at the source, \$1,064.50.</p>	<p>(6) Taxpayer aged 31, married; wife's income, nil; three children, aged 5, 3, and 1. Income from wages, \$3,410; union dues, \$36; charitable donations, \$42; medical bills totalled \$410. Tax deducted at the source, \$166.50.</p>

GENERAL PRACTICE IN FUNDAMENTAL OPERATIONS

1. Add.

(1) \$456.76	(2) \$543.87	(3) \$135.76	(4) \$789.90	(5) \$187.56
167.56	789.34	897.56	134.54	809.55
345.45	567.43	345.67	198.34	231.87
345.56	786.45	456.78	875.45	156.45
178.45	678.90	709.43	109.78	560.45
345.45	765.34	234.43	567.87	345.45
198.56	101.10	450.45	456.00	190.09
345.56	789.56	789.00	560.01	101.15
345.45	678.54	765.45	342.23	345.56
198.95	195.45	345.45	675.56	342.35
145.45	675.45	432.34	345.54	567.56
901.04	345.56	785.54	456.55	345.55
145.32	456.67	456.56	345.80	349.09
187.56	453.23	459.09	897.67	675.09
890.34	781.08	333.34	765.55	898.88

2. Find the daily balances in the following customers' accounts.

(1)

(2)

DATE	F.	DEBIT	CREDIT	BALANCE	DATE	F.	DEBIT	CREDIT	BALANCE
May 1		415.15			June 1	Bal.			167.56
5		134.56			3		11.78		
6			215.15		7		104.34		
9			15.45		8			167.56	
11		35.45			10			11.78	
13			200.00		14		35.00		
26		119.56			19			50.00	
27			19.11		21		56.54		
28		19.99			23			25.00	
29		14.55			26		178.55		
30		109.59			29			9.14	
31 Balance					30 Balance				

3. Find the total values of the following inventory lists.

(1)

(2)

134 bottles Ketchup @ .16		17 Hammers @ 1.32	
87 lb. Beans .07		13 " 1.67	
49 bottles Pickles .23		7 Saws 3.25	
11 jars Dressing .62		2 " 4.11	
145 lb. Sugar .08		451 packages Screws 1.21	
53 bags Flour .22		3 Fencing Tools 1.99	
91 " " .67		8 Needle Pliers .56	
154 cans Soup .13		4 pair Snips 3.09	
187 " " .14		3 Tap and Die Sets 6.17	
87 cans Peas .14		8 Wrecking Bars .65	
17 Brooms .89		13 Wrench Sets 1.98	
7 " 1.03		7 Butt Gauges 1.87	
4 cases Soap 3.45		19 Screw drives .44	
17 " " 1.39		23 " " .89	
14 bags Potatoes 2.89		15 " " 1.18	
23 lb. Dried Prunes .29		4 Cold Chisel Sets 2.89	
81 cans Salmon .31		17 Glass Cutters .39	

UNIT 10

CONSTRUCTION OF GRAPHS

CIRCLEGRAPHS

The Circle Graph

The graph in the illustration to the right is known as a circle or *pie* graph. Its purpose is to show graphically the relationship of quantities. The graph in the illustration shows the distribution of marks received by the 630 students of Utopia High School in December of 19--. By reading the graph, it can be seen that about $\frac{1}{3}$ of the students received firsts; $\frac{2}{3}$ seconds; $\frac{1}{3}$ thirds, $\frac{2}{3}$ passed; and $\frac{1}{3}$ failed.

Constructing a Circle Graph

EXAMPLE—Of 100 students enrolled in Grade 9 of Utopia High School, 25 dropped out in Grade 9, 17 dropped out in Grade 10, 9 dropped out in Grade 11, 6 dropped out in Grade 12, and 43 graduated. Prepare a circle graph to illustrate these figures.

Draw a circle of satisfactory size. Divide the circle into sectors in proportion to fractions of 100 as follows:

Grade 9 Drop-outs	—25/100 of 360 =	90 degrees.
Grade 10 " "	17/100 of 360 =	61 "
Grade 11 " "	9/100 of 360 =	32 "
Grade 12 " "	6/100 of 360 =	22 "
Graduates	43/100 of 360 =	155 "

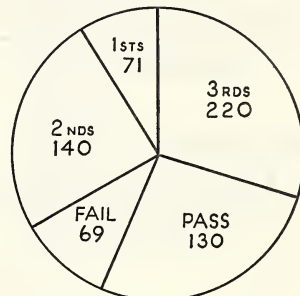
The circle can best be divided by the use of a protractor, an instrument to measure degrees of a circle. There are 360 degrees about the circle, and 90-degree sectors may be obtained by dividing the circle into quarters; and from these, the sectors may be estimated. The graph should be labelled to make it easily readable.

1. In the spaces provided, prepare circle graphs to portray the figures given in the following statements.

(1) Of 36 students in a class, 8 are 15 years of age, 11 are 16, 9 are 17, and 8 are 18.

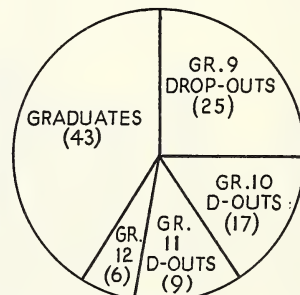
(2) A city spends \$5,000,000 of taxes as follows: Education—30%; Fire protection, —11%; Police Protection—7%; Libraries—4%; Social Service—8%; Public Works—31%; Parks and Recreation—7%, and the balance for interest on debt.

ANALYSIS OF EXAMINATION



UTOPIA HIGH SCHOOL
DECEMBER OF 1953

DROP-OUTS PER 100 STUDENTS



UTOPIA HIGH SCHOOL

LINE GRAPHS

The Line Graph

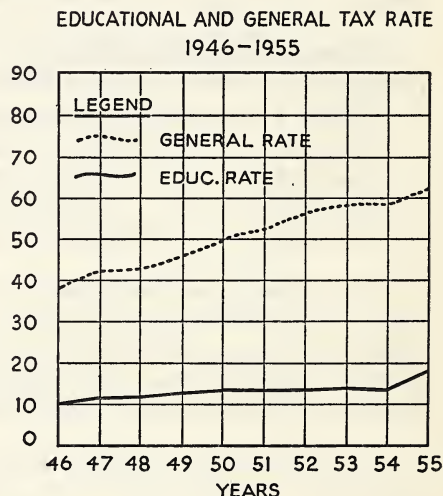
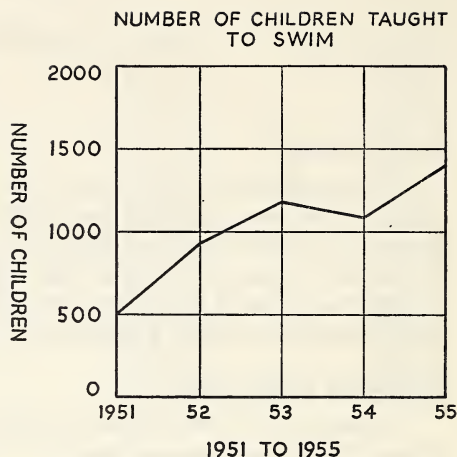
The graph in the illustration to the right is called a *line* graph. The line graph is used to portray a trend—such as a rise or fall in prices over a period of time. By reading the graph in the illustration, it can be seen that the number of children taught to swim increased from 500 to approximately 1475 from 1951 to 1955.

Construction of a Line Graph

EXAMPLE—The following table gives the tax rate for schools and for general purposes for a 10-year period. Show this in a line graph.

YEAR	EDUCATIONAL TAX RATE	GENERAL TAX RATE
1946	10.5 mills	39 mills
1947	10.6	41
1948	10.9	43
1949	11.2	46
1950	12.4	51
1951	12.4	53
1952	14.5	57
1953	15.8	58
1954	15.8	58
1955	19.8	63

Using squared paper, or by ruling paper into squares, provide one vertical line for each year. Rule the number of horizontal lines required to portray the largest figure in each column of mill rates (19.8 and 63). Draw in lines to show the trend from year to year. Print a suitable heading and identify the lines.



Prepare line graphs to portray the trends shown in the following tables.

1. **Cost of Living in Canada**
(1939 = 100 base.)

YEAR	INDEX
1944	118.9
1945	119.5
1946	123.6
1947	135.5
1948	155.0
1949	160.8
1950	166.5
1951	184.5
1952	191.5
1953	184.4

2. **Revenue Passenger Traffic**
Trans-Canada Air Lines
1940-1949

YEAR	NUMBER OF PASSENGERS
1940	53,180
1941	85,154
1942	102,762
1943	140,276
1944	156,884
1945	183,121
1946	305,442
1947	427,967
1948	532,555
1949	648,574

BAR GRAPHS

The Bar Graph

The bar graph is similar in purpose to the *circle* graph in that it is used most frequently to show comparative figures. The bars may be horizontal or vertical. Variations of the bar graph employ small pictures or silhouettes which represent quantities. The graph in the illustration to the right shows the relative typing speeds of eight students in a fourth-year typing class.

Construction of a Bar Graph

EXAMPLE—The following table gives the monthly sales of 6 salesmen of the King Bread Company, Ltd.

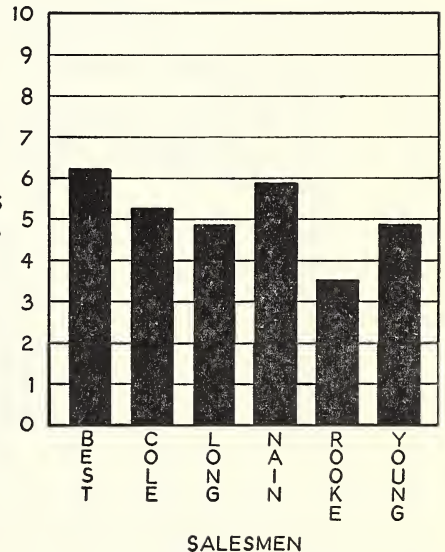
JANUARY SALES REPORT

SALESMEN	TOTAL SALES
S. Best	\$6,100.00
R. Cole	5,200.00
N. Long	4,850.00
C. Main	5,810.00
S. Rooke	3,451.00
B. Young	4,910.00

Prepare a bar chart to portray these figures.

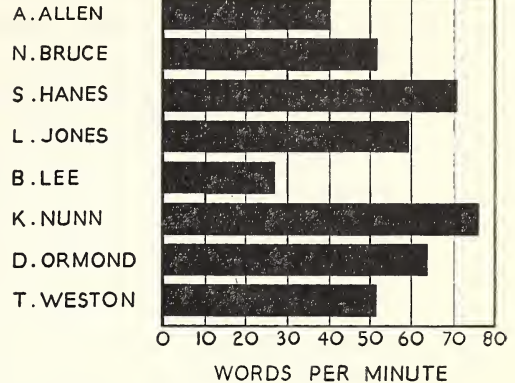
Rule off a square or rectangle with 6 columns separated by blank spaces— $\frac{1}{4}$ inch for the columns and $\frac{1}{8}$ inch for the spaces. Shade in the columns to correspond to the amount of each salesman's sales as in the illustration to the right.

THOUSANDS
OF DOLLARS



CLASS TYPING SPEEDS
C4B - 1953

STUDENTS



1. Prepare bar graphs to portray graphically the figures given in the following tables. (Prepare your graphs on a sheet of plain or squared paper and insert it in your workbook)

AVERAGE WEEKLY WAGES IN TEN SELECTED INDUSTRIES—DECEMBER 1, 19..

Metal Mining.....	\$69.62
Meat Products Processing.....	58.47
Rubber Products.....	57.14
Men's Clothing.....	36.55
Furniture.....	47.09
Printing.....	61.46
Motor Vehicles.....	67.70
Glass and Glass Products.....	59.22
Construction—Streets, etc.....	44.60
Service—Laundries, etc.....	30.40

DEATHS RESULTING FROM MOTOR VEHICLE ACCIDENTS, BY PROVINCES, 19--

Prince Edward Island.....	14
Nova Scotia.....	102
New Brunswick.....	90
Quebec.....	648
Ontario.....	844
Manitoba.....	106
Saskatchewan.....	91
Alberta.....	164
British Columbia.....	171

GRAPHS

1. In the spaces to the right, prepare graphs to portray the statistics given in the following tables.

- (1) Use a circle graph to portray the following information.

HOW THE COMMUNITY FUND DOLLAR IS SPENT

SOCIAL WORK	CENTS
Family Service	26.09
Red Cross	7.75
Handicapped Persons	17.61
Health and First Aid	17.31
Character Building	
Service to Youth	21.02
Central Services	7.73
Campaign Costs	2.49

- (2) Use a line graph to portray the following information.

UNEMPLOYMENT INSURANCE FUND. BENEFIT PAYMENTS—1943 TO 1953.

1943	\$ 27,752.92
1944	716,012.75
1945	1,721,666.29
1946	4,966,483.51
1947	31,993,240.34
1948	43,114,329.18
1949	34,947,020.32
1950	49,826,752.16
1951	85,006,136.24
1952	83,082,101.75
1953	85,559,677.68

- (3) Use a bar graph to portray the following information.

CANADIAN IMPORTS OF COMMODITIES (10 selected items)

COMMODITY	AMOUNT
Automobile Parts	\$117,748,000
Fruits	72,623,000
Automobiles	44,150,000
Artificial Silk	30,129,000
Glass and Glassware	25,403,000
Nuts	23,187,000
Beverages, alcohol	22,020,000
Furs and Products	19,576,000
Scrap Iron	7,917,000
Diamonds, unset	6,155,000

REVIEW ASSIGNMENTS

UNITS 1 to 10

UNIT 1 — FUNDAMENTAL OPERATIONS WITH WHOLE NUMBERS

1. Total the following Sales Report.

No.	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	TOTAL					
1.	\$165.57	\$345.41	\$457.34	\$745.09	\$789.25	\$723.35	\$435.55						
2.	655.85	345.45	783.24	389.34	908.82	456.23	555.35						
3.	789.34	789.56	490.40	234.32	490.32	123.45	890.00						
4.	143.45	789.34	456.67	345.65	498.75	389.23	189.95						
5.	789.54	234.56	789.34	903.24	234.23	789.23	456.23						
6.	870.45	345.65	723.23	456.23	148.23	187.75	190.43						
7.	911.34	890.45	890.35	150.00	245.78	189.23	789.34						
8.	671.15	876.45	345.74	235.35	717.18	879.54	876.45						
TOTAL													

2. Divide.

$$157 \overline{)674,786}$$

3. Multiply.

$$\begin{array}{r} 4,567,653 \\ \times 9 \\ \hline 42,387 \end{array}$$

4. A firm reports the following: Sales, \$46,208.56; Sales Returns, \$165.50; Inventory at Jan. 1, \$22,358.59; Purchases, \$46,247.85; Purchase Returns, \$457.45; Inventory, Jan. 31, \$26,345.75; Expenses, \$2,715.45. Find the net profit.

5. Calculate the following invoice.

101 yards @ \$.77 a yd.
 102 " " .42 a yd.
 99 " " .57 a yd.
 98 " " .34 a yd.
 145 " " .11 a yd.

Total _____

6. The salary for an office position is \$87.50 a week. In addition, each month, the employer pays \$4.70 for hospital care, \$6.90 for medical care, and \$4.50 for insurance.

(a) What is the actual yearly salary?

(b) What is the monthly salary?

UNIT 2 — FUNDAMENTAL OPERATIONS WITH FRACTIONS AND DECIMALS

<p>1. Simplify.</p> $12\frac{3}{4} + 13\frac{5}{8} + 27\frac{1}{3} + 3$	<p>2. Simplify.</p> $8\frac{1}{4} - 1\frac{3}{8} + 5\frac{1}{2} - \frac{1}{8}$
<p>3. Simplify.</p> $3\frac{1}{4} + \frac{1}{4} \text{ of } 2\frac{1}{8} - \frac{1}{2} \text{ of } (\frac{1}{4} + \frac{3}{8})$	<p>4. Simplify.</p> $\frac{1\frac{3}{5} + \frac{7}{10}}{2 - \frac{1}{3} \text{ of } \frac{1}{5}}$
<p>5. (a) Express as a common fraction.</p> $\frac{.2 \times 21.75}{.5}$ <p>(b) Express as a decimal fraction.</p> $\frac{5\frac{1}{2} \times 4\frac{1}{2}}{\frac{1}{4}}$	<p>6. A sample of coal contains .653 carbon, .007 water, .018 other combustible matter, and the balance is waste. How many pounds of each are there in 2 tons of the coal?</p>
<p>7. How much more pay is received by a man who worked $44\frac{1}{2}$ hours at \1.17\frac{1}{2}$ an hour than by a man who worked $47\frac{1}{4}$ hours at \$.81$\frac{1}{2}$ an hour?</p>	<p>8. From a tank containing 175 gallons, sales are made as follows: $11\frac{1}{4}$ gal., $17\frac{3}{4}$ gal., $23\frac{1}{2}$ gal., $21\frac{1}{4}$ gal., and $61\frac{3}{4}$ gal. What is the value of what is left at $26\frac{1}{2}$¢ a gallon?</p>
<p>9. In a school of 800 students, .65 of the students bought activity cards at \$1.25, and .32 bought Junior cards at 75¢ each. If printing cost \$17.25, advertising \$2.35, and sales promotion \$7.50, what net amount did the student council raise?</p>	<p>10. A merchant bought $53\frac{3}{4}$ yards of material at \$1.85 a yard. He sold $13\frac{3}{4}$ yards at \$2.75 a yard, $\frac{5}{8}$ of the remainder at \2.37\frac{1}{2}$ a yard, and the balance at \1.73\frac{1}{2}$ a yard. Find his gain.</p>

UNIT 3 — PER CENTS AND FRACTIONS

1. In the blank spaces write the required equivalents.

No.	FRAC.	DEC.	%	No.	FRAC.	DEC.	%	No.	FRAC.	DEC.	%	No.	FRAC.	DEC.	%
1.	2/5			6.		.625		11.			75	16.	1/6		
2.		.035		7.			70	12.	4¼			17.		1.05	
3.			135	8.	7/8			13.		.0075		18.			3½
4.	5/12			9.		.055		14.			166⅔	19.	1/9		
5.		2.3		10.			½	15.	9/10			20.		.1875	

2. Make the following calculations.

(a) 20% of \$625	(b) ⅓% of \$640	(c) 37% of \$210	(d) 120% of \$255
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3. Calculate what per cent the first quantity is of the second.

(a) 7 of 28	(b) ½ of 5½	(c) .03 of 4.5	(d) \$7.10 of \$63.90
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4. Find 100% of the amount in each of the following.

(a) 2% is \$14	(b) ½% is \$3.20	(c) 120% is \$852	(d) 98% is \$352.80
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5. Calculate

36 pounds at \$1.75	a lb.
35 " "	.20 "
48 " "	.37½ "
27 " "	.66⅔ "
25 " "	.12½ "
Total	_____

6. Show the total cheques and the total exchange at the bottom of the respective columns.

Cheques	Rate of Exchange	Exchange
\$240.00	⅓%	
290.00	¼	
4,522.00	⅓	
788.00	⅓	
310.85	¼	
723.34	⅓	
188.35	¼	

7. In the following, calculate what percentage each expense is of the gross profit and what per cent the net profit is of the gross (correct to 1 decimal place).

Gross Profit	\$ 9,600.00
Wages	\$2,100.00
Rent	900.00
Advertising	800.00
Taxes	840.00
General	2,700.00
Total Expenses	_____
Net Profit	_____
	Percentage
Wages	_____
Rent	_____
Advertising	_____
Taxes	_____
General	_____
Net Profit	_____
Total	100.0%

UNIT 4 — APPLICATIONS OF PERCENTAGE

1. How much would settle a bill for \$360 subject to discounts of 20% and 10%, if the terms are 2/10, n/30, and payment is made within the 10 days?

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2. (a) Which is the greater reduction — a series of discounts of 20%, 12½% and 10%, or a single discount of 37½%?

(b) By what amount would the greater discount exceed the lesser on an invoice for \$400?

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3. Goods which cost \$210 are marked up to \$280.

(a) What is the per cent of margin?

(b) What is the per cent of markup?

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4. What is the per cent of margin on goods costing \$48 which are marked up 25%, and then sold at a markdown of 10%?

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5. Goods which cost \$35 are sold at a gain of 12½%. What is the selling price?

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6. Goods which sell for \$4.80 are sold at a gain of 20% on cost. What is the cost?

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7. Goods which cost \$36 are sold at a loss of 20% of selling price. What is the selling price?

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8. Goods were sold for \$4.00 at a loss of 16⅔% of the cost. What was the cost?

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UNIT 5 — ADDITIONAL APPLICATIONS OF PERCENTAGE

<p>1. A commission agent purchased goods for \$280 for a client. He paid freight and other charges totalling \$31.83. If the commission rate was $4\frac{1}{4}\%$, what amount should have been billed to the client?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>2. An agent selling goods for a client on a $3\frac{1}{2}\%$ commission sent the client \$289.10 after deducting his commission and paying \$39 in charges. What was the amount of the sale?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>3. A house is insured for \$13,500 at a 3-year rate of 48¢. What is the monthly cost for insurance?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>4. A business property is insured for 3 years for \$10,000 at an annual rate of 49¢.</p> <p>(a) What is the amount of the premium?</p> <p>(b) How much is saved each year by taking the insurance for 3 years?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>5. A man insured his home for 15 months at a 3-year rate of 60¢. What is the amount of the premium? (Table, p. 48.)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>6. A business property is insured for \$8,500 for 10 days at an annual rate of 48¢. (Table, p. 48.) What is the premium?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>7. An insurance policy for 3 years, on which the premium was \$148, is cancelled after 3 months. What is the refund if:</p> <p>(a) The insurer cancels?</p> <p>(b) The insured cancels? (Table, p. 48.)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>8. A building insured with companies A, B, and C, respectively for \$7,500, \$5,000, and \$15,000 is damaged by fire to the amount of \$6,600. How much will each company be required to pay?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

UNIT 5 — ADDITIONAL PROBLEMS DEALING WITH INSURANCE

<p>1. A factory building was insured for \$20,000 at an annual rate of 47¢. The policy was cancelled after 10 months by the insured. What was the amount of the refund? (Table, p. 48.)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>2. A business man wishes to insure a stock of goods for 15 days for \$7,500. If the annual rate is 44¢, calculate the amount of the premium. (Table, p. 48.)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>3. The owner of a building had it insured for \$10,000 at a 3-year rate of 53¢. He cancelled the policy after 3 months. What is the amount of the refund? (Table, p. 48.)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>4. A fire insurance company found it necessary to cancel a policyholder's insurance after 6 months. If the premium for 3 years was \$45, what was the amount of the refund? (Table, p. 48.)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>5. If a man aged 25 years was insured on a 20-year endowment life insurance policy for \$5,000, how much would he pay in premiums before the policy matured? (For problems 5, 6, 7, & 8, use the tables on pages 53 and 54.)</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>6. If a man aged 25 years was insured by a 20-pay-life insurance policy for \$5,000, how much would he pay in premiums before the policy was paid up?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>7. A man who has had a \$3,000 policy in force for 11 years requires immediate cash.</p> <p>(a) How much will he get if he cashes the policy?</p> <p>(b) How much can he borrow on the policy?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>8. A man aged 30 years took out a \$5,000 life insurance policy of the ordinary endowment-at-age-65 type. At the end of 5 years he cashed the policy. What was his yearly cost for this protection?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

UNIT 6 — MUNICIPAL TAXES

<p>1. A firm constructed 3 identical buildings in 3 different cities, where they were assessed as follows: City A, \$9,000; City B, \$6,000; City C, \$12,000. The tax rates are 61, 89, and $53\frac{1}{2}$ mills, respectively. What amount of tax is paid in each city?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>2. A house on a 66-foot lot is assessed for \$4,800, and the lot for \$30 a foot. If the mill rate is 57, what is the total tax?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>3. In a town in which the total assessment is \$1,975,000, the tax requirements for a year total \$93,220. Calculate the mill rate correct to 1 decimal place.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>4. In a city where the separate school tax rate is 9.1 mills and the public school rate is 10.5 mills, how much more than a separate school supporter would a public school supporter pay on a home assessed at \$4,400?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>5. The total assessment of a city block where the residents wish a paved alley is \$180,000. If the paving cost is \$12,000, what annual mill rate would be required to pay for this over a period of 10 years?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>6. In a municipality, the assessment increased through new building from \$137,500,000 to \$140,850,000. If the mill rate is unchanged at 61.5 mills, how much additional revenue will be received as a result of the increased assessment?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

UNIT 7 — SIMPLE INTEREST

<p>1. A Credit Union charges 6% interest per annum on loans to its members. If a member borrows \$200 to be repaid in 4 equal monthly payments with accrued interest, what is the amount of each of the payments?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>2. What sum must be invested to earn \$302.25 in $6\frac{1}{2}$ years at $7\frac{1}{2}\%$ per annum?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>3. How long will it take \$730 to earn \$14.90 interest at 5% per annum?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>4. At what rate of interest per annum will \$400 earn \$13.20 in 219 days?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>5. A man borrowed \$500 for 60 days on security of his own note dated July 3 and bearing interest at the rate of 6% per annum. When must the loan be repaid, and how much will the payment be?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>6. By discounting his 90-day \$600 note, a businessman borrowed from his bank. If the bank's discount rate was $6\frac{1}{2}\%$, what were the proceeds?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>
<p>7. A 90-day promissory note for \$12,000, dated September 8, is discounted at 6% per annum on October 15. What are the proceeds?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>	<p>8. A 3-month promissory note for \$1000 and dated February 15, 1957, bears interest at 5% per annum. If it is discounted on March 16 at 6% per annum, what are the proceeds?</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p>

UNIT 7 — ADDITIONAL PROBLEMS OF SIMPLE INTEREST

1. The following balances appear in a bank savings account:

Oct. 31	\$675.80
Nov. 7	972.50
Dec. 11	544.18
Jan. 13	605.15
21	691.50
Feb. 11	411.21
Mar. 9	508.81
Apr. 7	603.12

Calculate the interest that should be added on April 30 at $2\frac{1}{2}\%$ per annum based on the minimum quarterly balance. (See p. 64.)

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2. The following balances appear in a bank savings account:

April 15	\$1,526.10
May 21	1,648.91
July 30	1,729.82
Aug. 18	1,521.15
Sept. 11	1,421.15
Oct. 21	1,644.18

Calculate the interest that should be added on October 31 at 2% per annum based on the minimum quarterly balance.

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3. A firm's overdraft at the bank for September appears in the account as follows:

Sept. 1	\$1,241.80
7	1,985.40
11	1,015.00
19	1,240.00
28	3,241.50

Calculate the interest that will be charged by the bank at 6% per annum on September 30. (See page 66 and use Method 1.)

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4. A firm's overdraft at the bank for January appears in the account as follows:

Jan. 1	\$235.54
11	125.00
17	714.50
22	905.15
23	791.48
24	801.53
31	105.15

Calculate the interest that will be charged by the bank at 6% per annum on January 31. (Use Method 2 on page 66.)

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5. Among its assets on December 31, a firm has a \$900 demand note dated October 1 and bearing interest at 7% per annum. What is the amount of the accrued interest on December 31?

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6. On April 11, 1957, a man borrowed \$350 at 6% per annum from his insurance company on security of his policy. If he wishes to repay the loan on September 15, what will be the amount of the payment?

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UNIT 8 — DOMESTIC AND FOREIGN EXCHANGE

1. Deduct the discount and add the exchange to determine the amount of each cheque.

No.	INVOICE	DISCOUNT	EXCHANGE	CHEQUE	No.	INVOICE	DISCOUNT	EXCHANGE	CHEQUE
1.	\$ 62.50	1%	1/8%		6.	\$ 182.30	4%	1/8%	
2.	210.00	2%	1/4%		7.	208.00	½%	1/4%	
3.	440.00	3%	1/8%		8.	135.00	2½%	1/8%	
4.	2,240.00	2½%	1/10%		9.	2,940.00	1%	1/10%	
5.	1,105.00	1%	1/8%		10.	610.00	10%&10%	1/8%	

2. What are the values of the following sums in Canadian dollars?

(a) \$400 U.S.A. (Discount, 3½%.)	(b) \$608 U.S.A. (Premium, 1½%.)	(c) 5000 francs (Franc = \$.0027.)	(d) 500 rupees (Rupee = \$.234.)
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3. How many francs can be purchased for \$1000 when the franc = \$.0211?

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4. How many Mexican Pesos can be bought for \$500 when the Peso = \$.127?

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5. Convert to pounds, shillings and pence.

(a) \$180 (£ = \$3.79) (b) \$750 (£ = \$2.81)

6. Convert the following to dollars.

(a) £5 6s 5d
(£ = \$2.80) (b) £75 10s 9d
(£ = \$3.00)

7. What is the equivalent in Canadian dollars for a salary of £10 9s 6d weekly when £ = \$2.81?

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8. Which is the more expensive: an English bicycle at £15 10s, or a Canadian bicycle at \$47.50? (£ = \$2.79)

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UNIT 9 — REVENUE TAXES

1. A desk is advertised by one firm at \$141.50 f.o.b. purchaser's office, sales tax included. Is this a better price than that of \$130, less freight and tax? If it is, by how much is it better? (Freight is \$5.40 and sales tax is 10%.)

2. A salesman drives his car 36,000 miles in a year at an average mileage of 18 miles to a gallon of gasoline. If the tax on gasoline is increased from 11¢ to 13¢ a gallon, how much extra tax per year will he pay?

3. Calculate the total duty and sales tax on a golf cart imported from U.S.A. if the purchase price is \$29.50, the U.S. dollar is valued at 96¢, duty is 20%, and sales tax is 10%.

4. Calculate the laid-down cost of a camera purchased in Germany for 1000 marks. The mark is valued at \$.232, duty is 37½%, sales tax is 10%, and excise tax is 10%.

5. What is the total duty and tax on 20 cotton canvas tents purchased in the U.S. for \$27.50 each? The U.S. dollar is valued at \$1.02, ad valorem duty is 37½%, specific duty is 3¢ per pound, sales tax is 10%, and each tent weighs 23 pounds.

6. What would be the laid-down cost in Canada of a trampoline bought in the U.S. for \$375 less discounts of 20% and 10% when the U.S. dollar is valued at 99¢, sales tax is 10%, excise tax is 10%, and duty is 25%.

UNIT 10 — CONSTRUCTION OF GRAPHS

1. Use a line graph to portray the following figures.

WESLEY TOWNSHIP SCHOOL ATTENDANCE 1944 to 1956

1944	181
1945	235
1946	290
1947	332
1948	330
1949	350
1950	355
1951	408
1952	578
1953	671
1954	709
1955	805
1956	1,120

2. Use a bar graph to portray the following figures.

REVENUE OF PROVINCIAL GOVERNMENTS 1949

Newfoundland	\$ 19,944,000
P. E. Island	6,375,000
Nova Scotia	44,426,000
New Brunswick	36,885,000
Quebec	244,514,000
Ontario	280,914,000
Manitoba	48,663,000
Saskatchewan	72,690,000
Alberta	98,626,000
British Columbia	145,090,000

3. Use a circle graph to portray the following figures.

COMPARATIVE EXPENDITURES OF CBC FOR 1952

Programs	43.29%
Engineering	16.44
Station networks	9.53
Administration	4.72
Press and information	2.41
Commercial	1.83
Interest on loans	1.82
Depreciation	3.36
Television	2.77
International service	13.83

4. Use a line graph to portray the following information.

AVERAGE YEARLY EARNINGS IN MANUFACTURING, 1940-49

1940	\$1,084
1941	1,220
1942	1,383
1943	1,525
1944	1,564
1945	1,538
1946	1,516
1947	1,713
1948	1,960
1949	2,068

5. Use a bar graph to portray the following information.

ATTENDANCE IN PROVINCIAL SCHOOLS 1950

Newfoundland	66,727
Prince Edward Island	15,043
Nova Scotia	111,813
New Brunswick	87,158
Quebec	585,000
Ontario	668,000
Manitoba	106,008
Saskatchewan	136,991
Alberta	146,388
British Columbia	147,584

6. Use a circle graph to portray the following figures.

SOURCE OF FEDERAL REVENUE—1952

SOURCE	AMOUNT
Customs duties	\$ 346,364,000
Excise duties	217,939,000
Income tax	2,161,373,000
Excess profit tax and Sales tax	576,834,000
Succession duties	38,207,000
Other taxes	318,053,000
Non-tax revenue	281,971,000

This image shows a blank, cream-colored page, possibly an endpaper or separator page from a book. A single vertical line runs down the center of the page, dividing it into two equal halves. The paper has a slightly textured appearance and a warm, off-white color. There is no text, handwriting, or printed matter on the page.

ROUGH CALCULATIONS

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APPENDIX 1

WEIGHTS AND MEASURES

THE ENGLISH SYSTEM

Length

12 inches (in.)	= 1 foot (ft.)
3 feet	= 1 yard (yd.)
5½ yards	= 1 rod (rd.)
320 rods	= 1 mile (mi.)
1 mile	= 1760 yards
1 furlong	= 220 yards
1 fathom (used to measure depth at sea)	= 6 feet
1 knot	= 6080 feet

Area

144 square inches (sq. in.)	= 1 sq. foot
9 square feet	= 1 sq. yard
30½ square yards	= 1 sq. rod
160 square rods	= 1 acre
640 acres	= 1 sq. mile
4840 square yards	= 1 acre

Volume

1728 cubic inches (cu. in.)	= 1 cu. foot
27 cubic feet	= 1 cu. yard
1 cord (used in measuring wood)	= 128 cu. feet
A cord of wood is 8 feet long, 4 feet wide and 4 feet high.	

Avoirdupois Weight

16 ounces (oz.)	= 1 pound (lb.)
100 pounds	= 1 cwt.
2000 pounds	= 1 ton
1 pound	= 7000 grains (gr.)
1 ounce	= 437½ grains
1 long ton	= 2240 pounds

Troy Weight

(used for weighing gold, silver and jewels)	
24 grains	= 1 pennyweight
20 pennyweights (dwt.)	= 1 ounce
12 ounces	= 1 pound
1 lb. Troy	= 5760 grains
1 oz. Troy	= 480 grains
The weight of diamonds is expressed in carats (k). 1 carat is about 3.17 grains.	
The fineness of gold is also expressed in carats. Thus, 18k gold is 18/24 by weight pure gold, the remaining 6/24 being of some other metal.	

Liquid Measure

4 gills	= 1 pint (pt.)
2 pints	= 1 quart (qt.)
4 quarts	= 1 gallon (gal.)
6½ gal. (Can.) in volume	= 1 cu. foot (approx.)
1 gal. (Can.) in volume	= 277.274 cu. inches
1 gal. (U.S.) in volume	= 231 cu. inches
1 gallon water weighs 10 pounds.	

Dry Measure

2 pints	= 1 quart
4 quarts	= 1 gallon
2 gallons	= 1 peck (pk.)
4 pecks	= 1 bushel (bu.)

Bushels by weight are as follows:

Barley	= 48 lb.	Oats	= 34 lb.
Beans	= 60 lb.	Onions	= 50 lb.
Beets	= 50 lb.	Parsnips	= 45 lb.
Buckwheat	= 48 lb.	Peas	= 60 lb.
Carrots	= 50 lb.	Potatoes	= 60 lb.
Corn	= 56 lb.	Wheat	= 60 lb.

Number

12 articles	= 1 dozen (doz.)
12 dozen	= 1 gross (gro.)

Paper

24 sheets	= 1 quire
20 quires	= 1 ream

Angles

60 seconds	= 1 minute
60 minutes	= 1 degree
360 degrees	= 1 circle
1 right angle	= 90 degrees

Lumber

The unit of measure of lumber is the board foot. To calculate the board feet in a piece of lumber, multiply the length in feet by the width in feet, and the result by the thickness in inches.

A piece of lumber 12 inches wide, 12 feet long and 1 inch thick measures 12 board feet.

